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ABSTRACT

This experiential education course was designed as part of an experimental program in education leading to a master's degree for teachers and administrators living in an isolated, rural area in Maine. Course outline, assignments, references, and lesson plans are provided. Elementary aspects of archaeology were used as the content from which to study experiential education. The objectives of the course were: to develop an understanding of experiential education; to acquire information and experience in a variety of experientially-oriented teaching strategies; and to learn the scientific method of inquiry. Assignments for participants in the course included readings; developing criteria for comparing experiential activities; developing two out of class experiential learning activities; taking field trips to and studying the architecture at Roosevelt's Home and Ocean View Lodge; and developing, implementing, and documenting two in-classroom experiential learning activities. The appendices comprise over half of the publication. Included are a mini lecture on the difference between experiential and traditional learning; four views of experiential education; readings on how children learn; worksheet for field trip to Roosevelt's summer house; an oral history packet; steps in the interview process; reprints of journal articles on how to design experiential curricula and simulations; and examples of three experiential activities. The Interact game "Dig" is also included. (Author/RM)

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Experiential Education as a Teaching Strategy

University of Maine at Machias
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BEST COPY AVAILABLE

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August 1981

CS 013 589

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A. Autograph Book
B. Outline of Archaeology
C. Differences Between Experiential and Traditional Learning
D. Four Views of Experiential Education
E. Role of Experience Reading
F. Dewey Assignment
G. I Do, I Understand Reading
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I. Oral History Packet
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M. Introduction to Dig Simulation
N. Criteria of Experiential Activities
O. Three Experiential Activities
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Q. Final Exam
R. Classroom Application Project Guide

I. INTRODUCTION

This course was designed as part of an experimental program in education leading to a master's degree for teachers and administrators living in an isolated, rural area in Maine. Class meeting dates and times were scheduled to accommodate the distances being driven and to take advantage of road conditions as winters are severe.

The theoretical content of experiential education is relatively sparse and scattered. There are parts of information in the fields of community education, career education, environmental education, and wilderness programs, but as yet a reputable, coherent body of knowledge has not been compiled. In compiling this course guide, an attempt has been made to reference all materials and include all course notes and worksheets, so that others can perhaps go farther.

Elementary aspects of archaeology were used as the content from which to study experiential education. Archaeology was selected because it is a discipline that 1) most adults in education are not familiar with, so new learning should occur, 2) lends itself to both indoor and outdoor experiential activities and 3) was new content for the instructor which made the course a stimulating experience to do. The field work was done on Campobello Island, but comparable field sites can be found anywhere. Through the distribution of this course guide it is hoped that others will be encouraged to document and share their experiential learning designs, so that those of us working in the "field" of experiential education can expand our knowledge and increase our skills.

II. COURSE OUTLINE

Experiential Education as a Teaching Strategy

A. Calendar:

September 11	5-8:30	On campus
September 12	9-3	Campobello Island - Roosevelt Home
September 18	5-8	On campus
September 19	9-10:30	Campobello Island - Interview Sites
	11-3	Welshpool School on Island
Septebmer 25	5-8	Greenland Point (Can stay overnight, if desired)
September 26	8:30-4	Greenland Point

B. Objectives:

1. To develop an understanding of experiential education through 1) theoretical and practical study 2) exposure to the content area of archaeology.
2. To acquire information and experience in a variety of experientially-oriented teaching strategies
3. To learn the scientific method of inquiry

C. Readings:

1. Article of own choosing on Archaeology
2. Howe, Harold, III "The Role of Experience in Education," Keynote Address, AEE, 1974. Mimeograph from: Association for Experiential Education, PO Box 4625, Denver, CO, 80204.
3. Dewey, John. Experience and Education. Macmillan Co., 866 Third Ave. NY, NY, 10022, 1938. (Available at University Bookstore.)
4. Nuffield Mathematics Project. I Do and I Understand. John Wiley and Sons, Inc. 605 3rd Avenue, NY, NY, 10016, 1967, p. 8-15.
5. Williamson, Jed. "Designing Experiential Curricula," Journal of Experiential Education, v II, #2 (Fall, 1979), p. 15-18.
6. Sc/5-13, "Organization of Fieldwork", Using the Environment: Ways and Means, Part 4. MacDonald Education, 850 7th Ave., NY, NY, 10019, 1975 p. 42-49.
7. Nesbitt, William. "To Simulate or Not to Simulate," Intercom, #75, 218 E 19th Street, NY, NY, 10003 (Summer, 1974) p. 2-11.

D. Assignments:

1. Complete readings
2. Develop criteria for comparing experiential activities (Dewey)
3. Develop 2 out-of-class experiential learning activities
4. Write up field notes from Roosevelt's Home and Ocean View Lodge
5. Develop, implement, and document 2 in-classroom experiential learning activities

E. Grade Based On:

1. Participation in class experiences
2. Completion of assignments
3. Test
4. Project

F. Desired Outcomes:

To have teachers use more experiential activities as the basis for student learning.

III. ASSIGNMENTS

I. Read archaeology article and complete sheet

II. Read Howe "The Role of Experience in Education"

III. Read Dewey and complete sheet

IV. Read "I Do, I Understand"

V. Organize and write field notes

VI. Develop 2 out-of-class experiences

VII. Read Williamson article

VIII. Read Nesbitt on Simulations and skim catalog

IX. Develop and implement 2 in-class experiential activities

IV. ADDITIONAL REFERENCE READINGS AND RESOURCES

1. Catalog, Social Studies School Service, 10,000 Culver Blvd. PO Box 802, Dept. II, Culver City, CA, 90230.
2. Cobb, Vicki. Science Experiments You Can Eat. J. B. Lippincott Co., E. Washington Street, Philadelphia, PA, 19105, 1972 @ $1.95.
3. Collins, Margaret. "Tackling Problems: Using the Environment," Sc/5-13, MacDonald Education, 850 7th Avenue, NY, NY, 10019, 1974 @ $5.95.
4. Expedition Game, The Kirk Game Company, Inc. PO Box 478, Belmont, MA, 02178, 1980 @ $12.00.
5. Gibbons, Maurice. "Eleusis: The Secondary School Ideal," Phi Delta Kappan, (June, 1976) 655-660.
6. Hart, Dan, et.al. Beyond Your Classroom: An Outdoor Activity Guide. Eliot Pratt Aspectuck River Valley, Outdoor Education Center, Paper Mill Road, New Milford, CT, 06776, 1972.
7. Hunter, David, et.al. Doing Anthropology: A Student-Centered Approach to Cultural Anthropology. Harper and Row Publishers, 10 E. 53rd Street, NY, NY, 10022, 1976 @ $10.95.
8. Interact All-in-one Catalog, Interact (Learning Through Involvement), PO Box 997 G, Lakeside, CA, 92043.
9. Keeton, Morris T. et.al. Experiential Learning: Rationale, Characteristics, and Assessment. Jossey-Bass Inc., 615 Montgomery Street, San Francisco, CA, 94111, 1976 @ $15.00(?)
10. McClure, Larry, et. al. Experience-Based Learning: How to Make the Community Your Classroom, Northwest Regional Educational Lab, 710 S.W. 2nd Avenue, Portland, OR, 97204, 1977 @ $9.95(?)
11. Porell, Burce, Digging the Past: Archaeology in Your Own Backyard, Addison-Wesley Publishing, Reading, MA, 01867, 1979 @ $5.95.
12. Schroeder, Ted. Social Science Projects You Can Do, Prentice-Hall, Inc., Englewood Cliffs, NJ, 07632, 1973 @ $5.95.

V. OVERVIEW OF COURSE STRANDS

Archaeology

1. Why archaeology?
2. What is archaeology?
3. Present knowledge of
4. Outline of field
5. Read article and review facts (Assign. I)
6. Relationship to Exp. Ed.

Strategies

1. Autograph Book
2. Infer from Junk
3. Roosevelt's Home
4. Oral History
5. Brown Bag
6. Dig Simulation
7. Expedition Game

Experiential Education

7. Read Howe "Role of...."
8. Present knowledge of exp. ed.
9. How is what done so far exp.ed.
10. How are activities alike
11. Minilecture I
12. Write summary statements
13. Read Dewey and develop criteria (Assign. II)
14. Read "I Do, I Understand" (Assign. IV)

15. How is field work Campobello archaeology?
16. Develop field problem (mystery)
17. Field assignments: topic, role
18. Campobello: data gathering, organize data, write field notes
19. Findings from readings I & II
20. Findings on Roosevelt
21. How does oral history fit archaeology?
22. Review of scientific process

(Archaeology continued)

23. Interviews of people knew Roosevelts
24. Verfication of conclusions from Roosevelts' home

29. Review Roosevelt work

31. Dig simulation facts

33. Expedition game: facts

(Experiential Education continued)

25. Comparing 2 field experiences
26. Brainstorm out of class experiences
27. Develop 2 activities
28. Read Williamson (Assign. VII)

30. Barriers to Experiential Ed.

32. Value of simulations

34. Relationship to exp. ed.
35. Facts from Dewey, "I Do, I Understand"
36. Dewey: Criteria for judging exp. activities
37. Use criteria judging 2 activities
38. List ideas for in-class activities. check against criteria, share 1
39. Question asking robot
40. Active involvement

VI. LESSON PLANS

FRIDAY, September 11th

5:00 1. What's this class about?

-Registration
-Course outline, expectations, objectives, grades, assignments
-Why archaeology

5:10 2. Who are we:

-Autograph book on Machias folders (Appendix A)
-Why did we do this?

5:30 3. Who am I?

-Pile of my stuff on table
-Infer from my stuff; list on board, I verify at end
-Why did we do this?

6:00 4. What is archaeology?

-What did we just do (in #3)?
-From that can we say/get close to a definition of archaeology "The science of finding, collecting, analyzing the material remains from the past".
-In small groups with newsprint "pool" what you know (your knowledge of archaeology).
-From your existing knowledge as a total group let's develop an overview of the field of archaeology (organizing our facts) (Appendix B).
-Are any of our facts wrong; don't fit, questionable?
-Assignment I: Check out your outline notes by reading any one article about any aspect of archaeology during the next week (Probably any National Graphic). On back of sheet record: bibliographical data of article, new facts: wrong facts: surprises.
-Assignment II: Howe "Role of Experiential Ed." (Appendix E).
-Supper.

7:00 5. Where does archaeology fit? or What is experiential ed?

-New content for most of us as adults (like kids learning to read) only we'll be learning it through an experiential approach
-What do you conjure up in your mind when you hear the words experiential ed?
List on board (Appendix D)
-List what things have we done so far?
autograph book
my junk pile
group pooling of facts
organizing facts

(Friday, September 11th continued)

7:00 (continued)

-How are those activities (?) alike? What do they have in common? What is experiential ed about? (Appendix C)
-How is what we've done so far experiential ed?
-From this discussion write 3 summary statements. "What is experiential ed about?"
-Take statements from group.

-Assignment III Read Dewey and develop criteria (Appendix F).
-Assignment IV Read "I Do, I Understand" (Appendix G).

8:00 6. Our Dig Tomorrow

-Tomorrow we go to Roosevelt's summer home: How is that archaeology?
-Using archaeology outline, What's the mystery/ questions?

-Generate class list of questions. e.g. What were the Roosevelts like?
-Prioritize by voting on question of most interest to total group. (Distribute Field Packet, Appendix H.)
-How do we organize to search our answer (by roles or by topic)?

SATURDAY, September 12 - Meet at Campobello
(9:00 - 3:00 our time, 10:00 - 4:00 their time)

AM: Find and collect data on topic using record sheets as needed

12:00 Lunch

PM: Organize/group data
Write field notes
Analyze data
Write brief report of conclusions

(Field Packet Sheets: Appendix H)

1. Purpose, Categories, Roles
2. Field Notes
3. Writing Up Field Notes
4. Thinking Levels

FRIDAY, September 18th

5:00 1. What happened last session? (Review/Warm-up)

-Who are we?
-What is archaeology?
-Doing an investigation, field work.
-Some on experiential education.
-Assignment - read archaeology; write findings.

5:15 2. What did we get from readings?

-Archaeology
-New facts
-Wrong facts
-Definition of
-Surprises
-Collect sheets.

5:30 3. Findings on "The Summer Life of Roosevelt".

-5 minute report on topic - Findings based on Facts
-As a group - Conclusions we can make.
-Points of agreement/disagreement - various perspectives.
-Ways we could verify findings and conclusions (next steps would be...). List.

6:15 Supper

6:30 4. Doing Oral History (Appendix I).

-As a way to verify findings and conclusions
-What do we need information on?
-How do we do it (interviewing)? Pass out.
-Organizing for Ocean View Lodge (Nursing Home).
-Why do this? How does this...
-further our understanding of "archaeology"?
-further our understanding of "experiential ed"?

7:30 5. Review the process Brown Bag.

-What's the mystery/question? "What's in the Bag?"
-Some guesses about what's in the bag - hypothesis.
-If the bag is sealed how do we search for the answer:
-Do them.
-Findings.
-Conclusion: Answer to "What's in the Bag?" based on findings.
-Verify: open bag to prove.

8:00 6. Tomorrow at Campobello.

SATURDAY, September 19th
9:00 (10:00 on Island) (Nursing Home or other interview sites)

9:00
1. Introductions
2. Findings places
3. Interviewing
4. Good-byes

11:00 Welshpool School on Island (lunch)

-Analyzing data in small groups.
-Findings and Conclusions verified in large group.
-Next steps if were to go on OR "What can we do now with all this information?"
  -To do's with students.
  -Value of this technique..
    -to you.
    -to kids.
    -to community.

12:00 Lunch

12:30 Experiential Education "Out of the Classroom".

-What we've done: Roosevelt's Home and Nursing Home.
-How were these 2 experiences the SAME/DIFFERENT from "field trips" as you know them.
  -List on board
    planning, focus, tasks, groupings, follow-up.
-Goods and Bads of these two experiences
  -List
  -Can this list be titled "The advantages/disadvantages of experiential education"?
  -Only one <u>type</u> of experiential ed. -- out of classrooms (in classroom experiential ed. next session)?
-Brainstorms out of classroom experiences that could be done
  -List on board and copy (add purpose to each experience).

Assignment VI: From this list plus other ideas you have design 2 out-of-classroom experiences you could do with your class that relates to content you presently teach (Appendix J).

Assignment VII: Pass out for reading "Designing Experiential Curricula" by Williamson (Appendix K).

Assignment VIII: Read Nesbitt on "Simulations" and skim catalog (Appendix L).

Note: Collect all findings - conclusions on "Summer Life of Roosevelt" plus tapes, plus class work sheets.

May go farther and develop a product depending on results of 11:00 discussion and "condition" of data....

3:00 End

FRIDAY, September 25th "Greenland Point - overnight"

5:00 Pass back Archaeology readings assignment

1. Closing on "Roosevelt".
   -Review decisions last meeting and see if still hold.
   -Close on techniques and value of.
2. Their Out-of-Class Experiential Ed. Assignment
   -Barriers from group.
   -Develop ways to resolve...
      -break into group on each barrier if appropriate.
   -Best solutions as total group.
   -Feelings about doing them.
      -Hards/easys.
      -Helps needed/how to get.
   -Collect and will return.

6:00 3. Moving on to "In-Classroom Experiential Ed."

   -Dig simulations (Appendix M).
      -Read pg. 1, 2, 3 of instructor's guide and student guide. (Supper).
   -Discussion
      -Learning on "archaeology" from reading
      -Things we would "DO" if we did the in-class simulation, list.
      -Value of doing this simulation with a class
         -Goods/Bads list of doing.
         -Easys/Hards list of doing.
   -Simulations you have done/know about.

7:00 4. Expedition Game

   -Set up with 6 players.
   -Do 10-15 minutes.
   -Learnings from archaeology.
   -Relationship to experiential ed.

(Can continue game that night.)

Saturday, September 26th Greenland Point

8:30 1. Experiential Education (continued)

-Discussion in small groups on Learnings about Experiential Education and record
  -Facts from Dewey reading.
  -Facts from "I Do, I Understand" reading.
  -Other things we know about experiential education.
-Post sheets and mill around room reading.
-Using Dewey criteria assignment compare lists in groups:
  compare with my list (Appendix N);
  things I forgot on your sheets.
-Use group list of criteria judge 3 activities (Appendix O).

9:30 2. Ideas for Experiential Education in Classroom

-Do individually.
-Check against "Criteria".
-Around room share ONE idea.

10:30 3. Structures for Experiential Education

-Review steps of inquiry process.
-Questioning as a strategy.
  -Open ended questions or higher order
    -Review questions from nursing home what questions got lots of data/no data.
    -Review class questions for Roosevelt visit (which ones open/closed).
    -Review questions on Archaeology Reading.
-Questions which encourage students' exploration and active participation.
-Identify key words in questions (verbs and you) (Field Packet H, 4).
-If a Robot arrived from Pluto and the responsibility for learning all we could about Pluto was your task, what questions would you ask?
  -5 minutes list; select 2 best.
  -Write best on board.
  -Only have 30 minutes to interview - 5 questions from list that would get most information.
-What was our "experience" -- moving to "active involvement" -- why did we do the Robot question?
-What things (?) can you do in classroom to get more active involvement? (student interests, etc.)
-Project Guide pass out: Discuss project (Appendix R).

(Saturday, September 26th continued)

12:00 Lunch

1:00 Order out of Chaos

-Go back to beginning of class.
-Order papers and review points as we order papers.
-Looking at it all: review interaction and involvement strategies.

1:40 Oral Quiz on Archaeology (Appendix P)

2:00 Quiet Space Test - 1 hour alone - Use any materials you have

As part of your science curriculum you have decided to create an "experientially based" unit which uses the school playground etc. (Appendix Q).

3:00 Collect Papers and Regroup in Small Groups

-Share your activities and objectives.

3:30 Talking Behind the Teacher's Back

-Me in chair back to them.
-What I thought about this class...
-Agrees/disagrees.

3:50 University Evaluations

4:00 End

VIII Other Content Ideas

Archaeology

-Porall, Digging Past

p. 40 boxes and guess
p. 4-5 wastebasket
p.41 imaginary person

p. 132-4 guessing solutions

-Hunter and Foley, Doing Anthropology

observations and writing

-Gardner, Selected Case Studies in American History, vol I

p. 18 Ericson vs Columbus (Who discovered America?)
Fusang

Inquiry Process

-using slides and reading (Russia)

-using picture and reading (Bushman)

Experiential Education

-"Ideal Secondary School" Gibbons article

-nature of the learner/steps of the learning process

-classroom activities promoting interaction

-levels of intellectual development (MORE) - Bloom
- Piaget

(*Teach in May and lead into a 2 week Experiential Program with adolescents with course participants teaching it)

VIII

APPENDIX

AUTOGRAPH BOOK

Using the inside of the folder get the following autographs in the next 15 minutes:

1. The signature of a left-handed person.
2. The signature of a person who read 20 books last year.
3. The signature of a person who has never been to Campobello Island.
4. The signature of the person who lives closest to you.
5. The signature of a person whose birthday is the same month as yours.
6. The signature of someone who has gone camping alone.
7. The signature of a person who has lived in Washington County all his/her life.
8. The signature of a person who has learned another language.
9. The signature of a person whose first name could be either male or female.
10. The signature of a friend.
11. A signature of someone who has read a book by John Dewey.
12. The signature of a person who attended the Teachers Convention last year.
13. The signature of someone who learned to use a computer.
14. The signature of someone who has been on an expedition.
15. The signature of someone who has never chopped wood.

Purpose:

OUTLINE OF ARCHAEOLOGY

DEFINITION: The science of finding, collecting, and analyzing the material remains from the past.

THE MYSTERY

THE SEARCH

THE SOLUTION

ASSIGNMENT I NAME

Bibliographic Data on Reading:

NEW FACTS

WRONG FACTS

SURPRISES

Differences Between Experiential and Traditional Learning

Theory of Learning: how learning takes place in person

Theory of Instruction: optional set of activities by "teacher" for bringing about learning

Information Assimilation	Experiential Learning
1. receiving information (usually lecture on book) about concept with examples	1. carry out action (does something in a particular situation and see effects
2. assimilating and organizing information so concept understood	2. understanding effects of what seen or done
3. infer application of concept	3. determining general concepts from particular action
4. apply concept (use/act)	4. apply understanding in new action
Advantages	Advantages
Short time Easy to do Large amounts of information	Less easily forgotten Depends less on language Intrinsic motivation (from action)
Disadvantages	Disadvantages
Depends heavily on language (written and spoken) Incomplete (understanding rarely occurs) Extrinsic motivation (grades)	Time-consuming Don't do well on written tests Incomplete (ability to infer to another situation rare) Harder to do

Keeton, Morris, et al. Experiential Learning: Rationale, Characteristics, and Assessment. Jossey - Bass Inc. 615 Montgomery St., San Francisco, CA., 94111, 1976, p. 49-61.

Four Views of Experiential Education

John Dewey, 1938 (Problem-Oriented)

That the conditions found in present experience should be used as sources of problems is a characteristic which differentiates education based upon experience from traditional education. For in the latter, problems were set from outside. Nonetheless, growth depends upon the presence of difficulty to be overcome by the exercise of intelligence. Once more, it is part of the educator's responsibility to see equally to two things: First, that the problem grows out of the conditions of the experience being had in the present, and that it is within the range of the capacity of students; and, secondly, that it is such that it arouses in the learner an active quest for information and for production of new ideas. The new facts and new ideas thus obtained become the ground for further experiences in which new problems are presented.

Northwest Regional Education Lab, 1977 (Community-Oriented)

Experience-based learning is a carefully structured series of activities using community resource people and their workplaces to provide not only the setting for sutdent learning but also the content. Facilities and expertise that already exist in the community are used to teach students skills they will need as adults-job-related skills as well as things they must know to function effectively as responsible citizens.

Experience-based learning asks students to take a more active role in designing anc carrying out their own education, gradually moving away from dependence on textbooks toward more independent learning from a variety of resources.

Outward Bound (Wilderness-Oriented)

Wilderness trips form an important part of the curriculum. They offer physical challenge to keep the body as well as the mind in fit condition. They offer an opportunity to learn specific outdoor skills; they underscore the need for teamwork and interdependence; and they provide a laboratory for the study of ecology, botany, and geology.

50 Strategies for Experiential Learning:

This series provides 50 new, field-tested experiences in four major categories: the get-aquainted process, self-development, interpersonal relationships and sharing, and group dynamics. The activities focus on such individual topics as self-awareness, perception, identity, feedback, self-assessment, interactive communication dynamics, and value clarification.

Assignment III

1. Read Experience and Education by John Dewey, 1938.
2. Develop a list of criteria for experiential activities.
   (This list of criteria should allow you to compare two activities and judge which activity would be the most educationally worthy of doing.)

3 How children learn

1a Learning and teaching
1b Memory and practice
2 The contribution of Jean Piaget

1a Learning and teaching

Just how do children learn? There are numerous theories concerning the various aspects of learning. All these are based on research, sometimes with animals, sometimes with children or even adults. Sometimes observations have been made of children or animals in natural situations. Other research has been carried out with individual children or with animals in specially contrived situations. All of it has helped towards the understanding of certain aspects of the learning process, but none of it can fully answer the question 'How do children learn?'.

There is clearly a relationship between learning and teaching, though much learning takes place without any teaching. Conversely there can be teaching that does not lead to learning. The relationship is sometimes obscure. The idea of a 'teacher' tends to complicate the situation; it could be taken to imply that the teacher knows and the child does not know, and so it is the task of the teacher to tell or otherwise instruct him. Today it is recognised that a teacher has not so much a set task to perform as a role to play. An interpretation of this role will be outlined in later chapters.

When teaching is seen as instruction then it is clear that it is the teacher who selects the topic (say long multiplication), demonstrates the process in technique, possibly on a blackboard, and endeavours to explain the topic as he goes along, stage by stage. The art of teaching in this context is dependent upon the use of the imagination in approaching the topic, the careful step by step development, and the skill used in explanation. Many teachers are remarkably skilled in this field, yet none of them would claim complete success. There are always some children who do not seem to understand or cannot grasp the issues involved or, having seemingly understood, cannot apply their new-found skill and knowledge.

1b Memory and practice

Very frequently children are asked to 'remember' such things as number facts or computational techniques. Some remarkable feats of memory have indeed been noted among primary school children. Yet some children find it astonishingly difficult to remember certain things. It is undeniable that some children leave school without being absolutely certain of their multiplication tables, and this in spite of all the efforts of the teacher – praise, encouragement, or threat; cajolery, reward, or punishment have each failed to produce the desired result.

Memory, although a useful tool, is clearly fickle. It seems to operate at different levels, and with different degrees of permanence. It is possible to remember a shopping list, a series of facts for an examination. When the shopping is done, the examination is completed, it is likely that the memory will cease to hold those particular facts. It would seem probable that sustained memory is closely linked with understanding, and that understanding indicates absorption into the existing framework already built in the child's mind. When teaching is seen as instruction then it will be necessary for children to be given the opportunity of practising their new skill. Children are sometimes asked to work twenty pieces of computation of a kind directly related to the example used for the demonstration/explanation part of the lesson. Undoubtedly, practice is necessary, but there is a significant difference between practice that is mere repetition, and practice that reinforces a conceptual experience. Demonstration→explanation→memory→practice can be a successful way of teaching a new skill, but to be valuable the skill must be both useful and used. Unfortunately children quite frequently fail to notice probable applications of the skill. When faced with a problem they might ask 'How do you do it?' or 'Is it a long multiplication?' It seems probable that practice should be seen as the reinforcing of something recently absorbed into the conceptual framework.

Nuffield Mathematics Project, I DO, AND I UNDERSTAND., NY, NY: John Wiley Co.,1967.

2 The contribution of Piaget

Recent work in the field of developmental psychology has thrown light on certain aspects of intellectual growth and development. Although there is valuable research going on in many parts of the world, it is the contribution of Jean Piaget and what is called the Geneva School of Psychology which will be mentioned here.

Piaget describes his method of research as 'clinical'. Test situations and materials have been devised to determine the stages in the building up of the basic frameworks of thought, described as 'mental structures'. The situations are play situations, and throughout the research clear instructions are available to enable testers to deal with any kind of response, in word or action, that the child might give.

This work in Geneva and elsewhere has indicated that although these 'mental structures' are built up gradually there seem to be certain stages through which all children pass.

Several stages are enumerated, but only two will be mentioned here:

1. The stage of intuitive thinking
2. The stage of concrete operations

The research indicates that children of about five years of age – the age when they enter school in Britain – are probably still thinking intuitively, that things are what they *seem* not what they *are*. If a thing *seems* bigger it *is* bigger.

Psychologists working in quite different fields have described what they call the borderline between fantasy and reality, and speak of the slow growth of the fantasy/reality adjustment. The Geneva research has shown the slow growth, and the many interim stages that exist, as the child passes from the stage of intuitive thinking to the stage of concrete operations.

Through a wealth of different experiences the child is enabled to establish the 'invariance' of such things as number, substance or liquid. He will realise that however he arranges his collection of five pebbles there will still be five. The 'invariance of five' is established. An amount of liquid poured into containers of differing shapes certainly appears to change, but eventually the child will realise that the amount actually remains the same. 'Invariance' of liquid has been established. Once invariance has been established the child is in a position to approach, with confidence, any real problem that arises from the use of concrete materials. The majority of children seem to enter this stage of *'concrete operations'* at approximately the age of seven.

This stage extends over many years and it seems that the ability to discard all real materials and work abstractly only emerges at around the age of eleven or twelve. There is, however, no spectacular overnight change in approach but a sequence of interim stages.

For example, some children of nine and ten years were investigating the volume of certain containers. They approached the problem in several different ways, one of which was to fill hollow home-made inch cubes with sand and pour them into the containers. After much filling, pouring and counting they declared 'We needn't do this any more. All we have to do is multiply the dimensions'.

Such a moment of enlightenment does not indicate that from then onwards the child will be able to cope with 'formal operations' (the term Piaget uses for the abstract solution of problems) but that he is entering the significant transitional stage. Any attempt to hurry children through this stage of development is liable to lead to a serious loss of confidence. They will discard real materials themselves at the appropriate moment, as the above example indicates, and eventually, when faced with a problem, will ignore all available materials and approach it abstractly.

5 Learning through discovery

1 Active learning
2 Problems
3 Questions

1 Active learning

From time to time certain words attain a new significance through their use in the vocabulary of educationalists. Quite frequently they are subsequently mis-used and abused or at any rate widely misunderstood. The word 'discovery' stands in danger of such misinterpretation today. In order to understand why it is now widely believed that children learn through their own discoveries, and what, in this context, is meant by 'discovery', it is necessary to consider some of the wider implications.

The Hadow Report of 1931 contained this famous sentence: 'The curriculum is to be thought of in terms of activity and experience rather than knowledge to be acquired or facts to be stored'. In this instance it was the words 'activity' and 'experience' that became emotive, and were widely misinterpreted. Not that they were inappropriate: rather that the climate of opinion was not yet ready to accept them in the context of the classroom situation. Even then, in 1931, there was nothing very surprising in the statement. Good teachers had always felt instinctively that their children seemed happiest and even seemed to learn most through 'doing'. This report foreshadowed the exciting developments of primary education notably in the post-war years. Teachers have discovered that knowledge can be acquired and facts gradually stored through 'active learning', and that when children are actively involved in real situations the process can be most exciting for teachers as well as children. The work of Piaget would seem to indicate that the majority of the children in primary schools are passing through what he terms the stage of concrete operations, that they are able to deal confidently with real problems arising from the use of concrete materials. The evidence produced by his team of research workers fully substantiates and justifies the belief that children learn through activity and experience.

A group of three in the classroom discussing among themselves the graph they have made from their findings

All experience, and not least that in the realm of mathematics, offers the possibility of the discovery of relationships. A young child will discover that 'this lid fits on to this tin'. There is a relationship between the lid and the tin. Older children measuring their heights and shadows will discover that there is an interesting relationship between them. Children who have been encouraged to look for patterns and relationships within their experiences develop a particular sensitivity. In the early stages of this work it is more than likely that there will be some children who, say, measure heights and shadows, but never look beyond the actual measurements and so discover nothing. It is the role of the teacher to suggest a certain arrangement of the data, or to ask a question demanding some evaluation of the data in order to lead the child to the discovery of the relationship. This demands great skill from the teacher. It is so much easier just to tell the child what to look for, yet the whole joy of discovery is thereby missed.

2 Problems

When primary school mathematics consisted largely of arithmetic and was thought of only in terms of knowledge to be acquired and facts to be stored the subject was frequently sub-divided into 'mental', 'mechanical' and 'problems'. A problem in this context meant a piece of mechanical arithmetic disguised by the use of words. The disguise was all too often quite successful, and children found difficulty in unravelling the words and revealing the mechanical arithmetic. On other occasions the disguise was thin and no 'problem' at all was posed.

But a real problem involves far more than this, for it involves both the objective assessment of a situation and the posing of a question concerning it. Problem-provoking situations can arise or may be teacher-contrived. This will be considered more fully in Chapter 6, 'The use of the environment'.

The solution of genuine problems and the judgement-making involved are integral parts of living. This is particularly true of

a democratic society going through an era of rapid change. The confidence to assess situations, formulate questions, and attempt to determine solutions only grows through experience, yet it is something that all children urgently need today. This confidence is intricately bound up with the growth of a healthy attitude towards mathematics without which there can be little progress made.

There remains the whole question of motivation. If a problem is really meaningful to the child then he will be strongly motivated to solve it. It is only when the problem is totally divorced from the 'here and now' of the child's personal interest and experience that the unreality obviates genuine motivation. It is, of course, possible to motivate children by means of a system of rewards. A young child will endeavour to get his sum right in order to gain a tick, the symbol of success and approval. An older child will work hard to solve his equation in order to pass his examination. Both these are artificial motivational devices which have of necessity evolved within a competitive society. If the problem emerges within the framework of the child's experience, then no artificial device is needed to encourage him to work towards a solution.

3 Questions

If a problem involves the posing of a question concerning a particular situation it must be determined who it is who asks the question, and of whom. Formerly it was accepted that it was the teacher who asked the questions in the classroom situation, and the children who supplied the answers. Such questions were almost inevitably 'closed'; there was no real enquiry. The teacher already knew the answer, and posed the question in such a way as to obtain the correct response from the child.

For example: 'What are seven eights?' Correct response: 'Fifty-six'.

It was, of course (and still would be), very important to 'get this right'.

But it is now recognised that there is a place for children's questions as well as those of the teacher, and for 'open-ended' as well as 'closed' questions. There are occasions when there is a particular and precise answer to a problem; in effect the question is 'closed'. Not all problems, however, lead to a solution of this nature. Some situations open up many avenues of investigation, and in the beginning it is by no means certain that one precise answer is possible. Questions arising from these situations are the ones referred to as being 'open-ended'.

Children's questions can arise in many ways. Sometimes an experience in or out of school provokes a direct question posed by an individual child to a teacher. It is all too tempting for the teacher to supply an answer, but the role of the teacher in this circumstance is to discuss the situation with the child. From such discussion a possible avenue of investigation will emerge. One of the most difficult tasks a teacher has to face is to refrain from giving direct answers: the child must be encouraged to make discoveries for himself.

It must be remembered that children's questions arise from varying needs. Sometimes the question is a function of natural curiosity, sometimes it reveals an emotional need. A disturbed child will ask questions simply to gain the attention of the teacher. In recognising this need and meeting it by having a few moments' discussion with the child, the teacher will be making a significant contribution towards his eventual stability.

Questions can arise from an organised group activity. Some 6-year-olds had made a block graph concerning their birthdays. They noticed that the April column was higher than that of any other month. After some discussion a clear question emerged, 'Are there always more people born in April than in any other month?' To the children at first it seemed as if this was a 'closed' question. It could be answered by a 'Yes' or a 'No'. Their subsequent investigations led them to conclude, 'Unless we could ask everyone in the world we couldn't find out'. They had discovered the inadequacy of

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their original graph: that in statistical terms the size and selection of the sample affects the validity of the conclusions.

Other questions arise from a common experience. One day some men arrived to paint the lines on the school playground, and in particular the lines of the netball court. Some children who had become interested in circles asked 'Are those goal circles on our netball court true semi-circles?' Here again the question appeared to be 'closed' and, in fact, proved to be so. But the lines of investigation initiated by the children not only solved the immediate problem but opened up new fields of enquiry. For example, some children became interested in other shapes actually on the playground.

It was suggested in Chapter 2 that the natural approach of a primary school child to his environment is an empirical one, and that the last stage of an investigation concerned the communication of findings. When children reach a conclusion to their investigation which satisfies them they frequently discuss it with their teacher. It is through this discussion that the teacher can determine just what the child has gained from the experience, and so make some estimate of his progress.

Field Work: Roosevelt's Summer Home
Campobello Island

Purpose: To find (and collect) information from the material remains in Roosevelt's summer home that tells us _____

_____.

Meet at 9:00 (10:00 Island time) at _____.

Bring lunch and "TOOLS"

Categories of Search

Possible Roles:

a. artist
b. photographer
c. mapper
d. librarian
e. recorders (registrar)
f.
g.
h.

Field Assignments

My task:

Group:

Tools needed:

Appendix H

Name: _____

Field Notes

Category

The Search (Finding/Hunting)

Facts (Aritfacts)	Location (where)
1.	

The Solution (Analysis)

Finding (Meaning)	Supporting Evidence

A BREAK-DOWN OF THE LEVELS OF THINKING

Level 6: EVALUATION

interpret	decide	dispute
justify	infer	rate
criticize	conclude	set standards for
verify	select	weigh
judge	choose	solve

Level 5: SYNTHESIS

compare	design	reorganize
contrast	redesign	restate
predict	reconstruct	systematize
translate	rearrange	symbolize
extend	rename	vary
hypothesize	regroup	formulate
substitute	modify	minimize
maximize	alter	connect

Level 4: ANALYSIS

take apart	differentiate	subtract
part of	divide	associate
fill in	isolate	relate
take away	order	pattern
put together	separate	group
combine	distinguish	arrange
dissect		

Level 3: APPLICATION

use
demonstrate
show
construct
experiment

Level 2: COMPREHENSION

classify	give relationship
summarize	describe in own words
organize	state in own words
confirm	interpret

Level 1: KNOWLEDGE

remember	list	state
recall	define	describe
recognize	identify	gather
respond	name	

NOTE: You may want to post this list on oaktag in your room so your students can refer to it.

Writing Up Field Notes

The Process

1. Make a list of facts with evidence
2. Categorize and group facts
3. Sequence in categories, if appropriate
4. Draw conclusions
5. Write up report

Helpful Hints:

1. Give all evidence which supports finding (The more evidence the better).
2. Only make statements you can prove.
3. Be sure no other facts contradict your findings.
4. Make conclusions from groups of findings.
5. Make conclusions tentative (probable, possibilities, likely that)
6. Check your perceptions with someone else to be sure no other conclusion/answer is probable.
7. Be very specific in descriptive detail
8. No assumptions are permissible, only observable facts.

Science 5/13 Project, Using the Environment: Ways and Means, Macdonald Educational, 850 Seventh Ave. NY,NY 10019, 1975

5 Organisation of fieldwork at a distance from the base

Since so much of children's scientific experience between the ages of five and thirteen years will be connected with their questions and the different things they find interesting wherever they happen to explore, it is obvious that teachers must be prepared to adapt the organisation of fieldwork to suit many situations.

We know that children need some time for general reconnaissance when they begin to work beyond the classroom, in order to discover what is there. Ways of organising these earliest expeditions, so that time is spent purposefully yet freedom to explore is not restricted, have already been considered in the first volume of this book.

In Volume 2 we are concerned with the variety of individual investigations many children develop when they focus their attention on certain living things or material they find particularly interesting. Since they need to do so many different things at different times, their studies are likely to flourish when the school day is organised flexibly and free movement of children between classrooms and outdoor places is possible.

Children can also deal with different self-appointed tasks in this informal way when sites close to residential field centres are used.

In many cases, however, places at a considerable distance from school and with no residential accommodation must be used if children are to develop outdoor studies to any extent.

When schools are situated in very built-up districts this may be unavoidable at an early stage: in other cases children with some experience will need to range farther afield to compare new places with those they know.

There will be certain conditions which will become increasingly limiting when the distance between the school and the study area increases, for example:

1. All members of the class must visit the site at the same time.

2. Time for reconnaissance and collection of data and specimens may be rather short for places such as woods or ponds that offer a bewildering amount of material.

3. Return visits to the site may not be possible.

In addition to these difficulties, planning and the giving of explanations to large groups out of doors are unlikely to be effective. Therefore some division of labour must be organised before the children set out so that they can reach the site knowing the jobs they have to tackle. In this way there is a better chance of avoiding haphazard collecting, superficiality and confusion. Even when organisation is more precise the emphasis must be on exploration. Planning a campaign need not involve revealing what can better be discovered.

The teacher's role

During the month before the outdoor expedition

Preliminary preparation

1. Visit the site for general reconnaissance and to find out what investigations are likely to prove profitable.

Gather data for checklists (if required).

Ascertain what features are likely to cause problems.

heck on the nearest telephone and doctor.

Much of this information can be supplied by wardens of ld centres, but teachers should still make personal sits to areas they do not know so that they can think bout the investigations in relation to the children they ropose to take to the site.

Administration: give information to parents about the lace, the cost, suitable clothing, safety precautions.

ake arrangements about transport.

Contact the landowner about access to the site (if ecessary).

Resources: collect the OS maps, base map of site, hecklists and reference books.

ven when these aids are available at field centres they ay need to be adapted for different problems or for use y children of widely differing abilities.

Make contact with the helpers—students, parents.

reparation with the children

Meet the whole class to set the scene and consider ypes of investigations possible on the outdoor site.

Give children opportunities of volunteering for the roup work they wish to tackle. Help uncertain children.

Allocate time for group discussion and act as nsultant to these groups. This is a very vital part of e enterprise.

hrough it children can consider the best way of pending their time on the site, that is set themselves asks. They can also list the equipment they must take nd construct any home-made apparatus they may eed.

urposeful activity on the site is more likely if previous ays of tackling the assignments have been worked ut.

Teach and organise practice in necessary techniques ee pages 50-56).

5. Give children guidance about suitable clothing: rubber boots or strong shoes, thick socks, warm jumper or pullover, windproof jacket, mackintosh and hat, gloves (in winter).

6. Discuss arrangements about safety. The children should be told about keeping within the boundaries of the site. They must also be told what to do if they become separated from their group and instructed about arrangements for the recall of groups. Give clear instructions about the use of the whistle for these purposes.

Make sure first-aid kit is in good condition (see page 84 for details of contents).

During the day before the outdoor expedition

Check that groups have collected the equipment they will require and have prepared jars, bags, etc. for carrying back living material.

Give reminders about travelling arrangements, packed lunch (if required), clothing and safety.

On the site

1. Establish a base on arrival. A parent can help by keeping this under observation.

Establishing a base

2. Lead a rapid reconnaissance for the purpose of indicating boundaries, main landmarks, etc.

3. During group work, circulate and act as consultant.

4. Give the signal for groups to stop work and check equipment.

5. Before departure remind children to make sure that no equipment or litter is left on the site.

On return to school

See that children attend to living material and return equipment to the right places.

While follow-up work is in progress:

1. Act as consultant to groups by offering leading questions, suggestions and critical comments.

2. See that equipment and raw material required for studying specimens and making records are available.

3. Teach any techniques required for investigation or making records, for example, using simple keys and the stereomicroscope, preserving and mounting specimens.

4. Offer constructive criticism as group work is assembled.

5. Chair the class meeting held to consider the work as a whole.

6. Encourage children to arrange an 'open' afternoon for their parents.

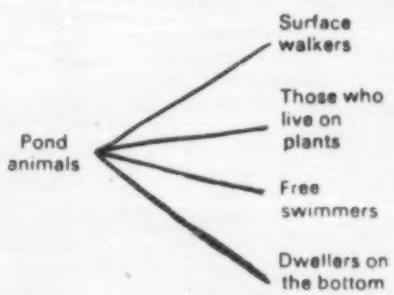
Investigations on the outdoor site

When children have had some experience nearer home they will probably be able to suggest different fields of investigation that must be undertaken in studying an area, for example:

The general description.
Trees and shrubs.
Herbaceous plants.
Small invertebrate animals.
Bird life.
Common materials.

At certain seasons some additional work could be undertaken with advantage, for instance the study of grasses in June, and of fungi in woodland in the autumn.

On some sites it may be appropriate for the children, especially as they become more experienced, to share the study of particular types of plants or animals.



Wild mammals are elusive and therefore unlikely to be suitable for study on single expeditions. Some of their tracks (skulls, fur, footprints) may be found, and these will be worth collecting and recording

Division of labour

Children can form themselves into small groups for covering the investigations appropriate to the site visited. In some places, for instance woodland, many jobs can be tackled. Other places, such as chalk downland in July, will provide fewer groups of specimens—only insects and flowering plants—but in much greater abundance. Then it is better for more groups of children to concentrate on a smaller number of investigations. Valleys and lengths of hedgerow, wall and footpaths have two sides, so that if they are studied class groups must be duplicated to obtain data for comparisons.

The following chart gives a rough idea of the division of labour appropriate to different study areas.

Appendix H

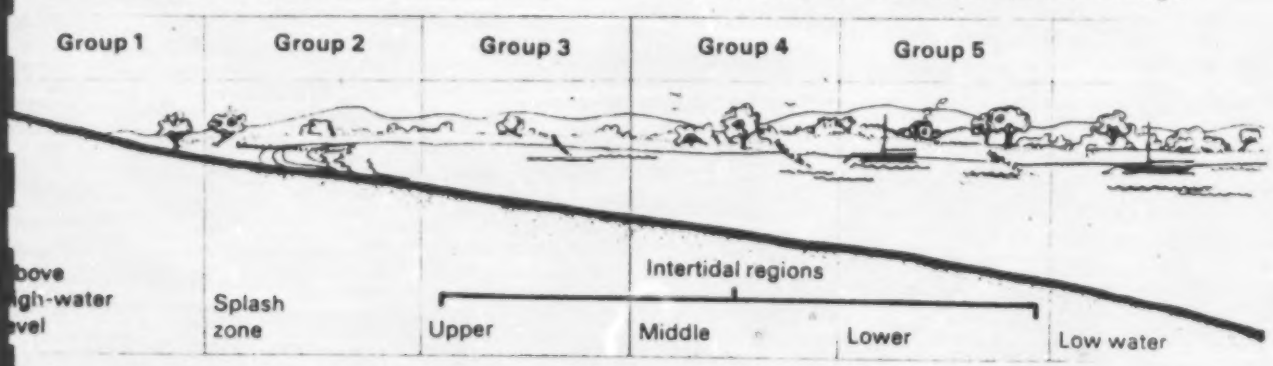
	General description	Trees and shrubs	Herbaceous plants	Small inverte-brates	Birds	Materials
Waste ground	\	\	\	\	\	\
Park or woodland	\	\	\	\	\	\
Hedgerow	\	\	\ \	\ \	\	
Both sides of a footpath	\		\ \	\ \		\
Valley	\	\ \	\ \	\ \	\	
Chalk grassland	\		\ \	\ \	\	
Heath or moorland	\		\ \	\ \	\	
Marsh or bog	\		\ \	\ \		
Pond	\		\	\ \ \		\
Stream	\		\ \	\ \	\	

\ Represents 1 group of children

When working on a rocky seashore it may be better to allow all groups to deal with plants (mainly seaweeds), small animals and materials in different areas.

If possible children should be allowed to select their investigations, but groups should not consist of more than six individuals. This may entail some persuasion, but usually the more uncertain children are willing to make the groups fairly even.

If a number of places are visited children should be encouraged to undertake different investigations on different occasions and so gain experience of a wide range of things to be found in their surroundings.



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Ideas for group assignments

Describing the study area

Methods for dealing with this task must be selected according to the nature of the site

Possible observations

1. The sizes and distances obtained by estimating, pacing or measuring.

2. The shape of the land, whether it is level, uneven, with holes, or sloping.

3. The slopes: their aspect (north, south, east or west) and any change of levels.

4. The position of exposed, sheltered or shaded places.

5. Visible features of rocks and soils (quarries, flints, sand, alluvium, etc).

6. The rate of flow of any water.

7. Conspicuous features:

Areas of vegetation or water.
Linear objects—fences, ditches, walls, footpaths.
Single landmarks—pylons, hollow tree, building.

8. Evidence of influences changing the area: grazing animals, hedging, coppicing, building, etc.

9. Features of special interest, like molehills, the entrance to a badger sett, a squirrel's eating place, etc.

In addition to written notes and sketches children could use one of the ways of recording information shown in the table above right.

Method	Suitable for	Examples
Making a plan of the site	Places where the physical features are regular in shape and easily accessible for measurement	Part of the school grounds or a local park
Marking significant features on a base map supplied by the teacher	Places containing much variety where all parts may not be easily accessible for measurement	Woodland
Mapping by use of baseline and offsets	Small irregularly shaped areas where all parts are easily accessible	Piece of waste ground Areas of heathland
Mapping with the aid of a string grid	Very small irregularly shaped areas	Rock pool Small patches of ground undergoing colonisation
Constructing a profile	Where levels change conspicuously	Hedgerow Seashore

Observing plants—trees, shrubs and herbaceous plants

It is often wise to ask members of groups concerned with plants to limit their attention to three or four of the most common species on the site. In this way confusion that may arise from the number and variety of plants can be avoided and the need to collect specimens is reduced.

On arrival at the site members of plant groups should reconnoitre for a short time in order to select the trees and other plants they intend to study.

After this, three types of activity are likely to prove profitable.

Gathering data about the growing plant in relation to its natural surroundings

Here are some examples.

1. Habitat conditions (dry, wet, shady, exposed, etc).

2. The numbers of the selected plant in a given area in relation to the numbers of other plants.

3. Estimations and measurements of size and space occupied (averages).

4. Variation in the numbers of a plant and its sizes in different parts of the site; how far this gives character to the area; and the way this may be affecting other living things in the vicinity (by shading, climbing, etc).

5. Whether it is being affected by animals or other plants.

Sketching details that can only be observed on the site

Here are some examples.

1. The way branches grow from a trunk and the height at which they appear.

2. The general appearance of a plant, for instance the rosette of a daisy, the drooping habit of false brome grass, the twisting of honeysuckle, etc.

3. The arrangement of a leaf mosaic or inflorescence.

4. The relationship of a bracket fungus to a tree trunk or stump.

Collecting specimens for magnification and further intensive study on return to school

One collection for the whole group is sufficient.

Material to be found will depend on the season of the year, but the objective should be a collection as fully representative of different parts of the plant as possible.

Note. Uprooting should be avoided.

Specimens illustrating the following principles are particularly valuable:

Variation of size, shape, etc, of similar parts.
Adaptive features.
Protective mechanisms.
Seedlings in different stages of growth.

The ground around growing plants should be carefully investigated for parts that have been shed—leaves, leaf skeletons, scale leaves, seeds, fruits, etc.

Specimens should be placed carefully in plastic bags for transport to school, and if they are living, they should be placed in water immediately on arrival.

Observing small invertebrate animals

Members of this group may find they can deal more efficiently with this topic by forming into pairs

In Volume 2 Part 1, pages 12-15, various places where small creatures can be found and appropriate methods for collecting them have been listed. Pairs of children can distribute themselves among any such places in their study area and carry out searches for small creatures in the ways suggested. Any tracks such as cast skins, shells, etc, should also be collected.

Finds should be placed carefully in specimen tubes or small tins together with some of the plant or substrate on which the animal was found to serve as food. All containers should be numbered and each number recorded in the field notebook together with the creature's name (if known) and some descriptive information about the place where it was found.

As they work children should also spend some of their time quietly observing free animals and try to collect information about some of the following things in their field notebooks:

The visibility of the animal in relation to its surroundings.
Where it goes or comes to rest.
Its actions—how it moves, whether it is feeding, carrying something, or making sounds.
Any ways in which it may be affecting other things.

Before leaving the site there should be consultation between members of the group to make sure that creatures to be retained for further study in school are varied. Surplus specimens should then be released.

As soon as the children return to school they should place their creatures in permanent or temporary accommodation, prepared beforehand, together with supplies of food.

ORAL HISTORY PACKET

9. Oral History

Written records are not the only resources that can be used to obtain personal accounts of a period. If the site is recent enough or still in use, an elderly person living nearby might remember some of the details of the area's history. Information gathered through conversation is known as oral history and can be valuable for filling in details and adding to your understanding of the past.

From interviews with residents you can find out many things. What kinds of activities have taken place at the site over the years? What changes have occurred in the buildings and land? Who owned and worked the property and are there any anecdotes about them?

Choose an old house, store, or factory that you would like to know about. Ask around. Is there an elderly person who has lived in the area for years? Telephone this person and ask if you might interview him or her about the site that you are interested in. Prepare some questions ahead of time. Ask questions like these:

> Has the site changed much in apearance over the years?
> What was made or sold there?
> How were goods picked up or delivered?
> What raw materials were used? How were they prepared for use?
> What were the steps to making the product? (One recent interviewer discovered the store she was researching carried "everything" — including false teeth!)

Going to your interview with a prepared list of questions will prevent embarrassing silences while you try to think of another question to ask, and will ensure that you get at least the information you came to get. Often you will find that you end up with far more information than you expected, a new friend, and some great stories from the past.

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Use a notebook or a tape recorder to get your information correct. Bring a friend along, you'll be a lot less nervous. Don't forget to ask if there are others who might have information about your area of interest. Good research often opens up new areas to explore.

All of this background information is important, but the archaeologist must be careful not to rely too much on it. History, after all, is written by people; and each person views an event or a period according to his or her own experience. When personal experience colors the facts, the distortion is called prejudice. Prejudice may show up in descriptions even when people are trying to be totally honest and accurate. Nobody can see everything that is going on and remember it accurately.

The information dug up from the ground may disagree with information found in old documents. In the end it is the artifacts that the archaeologist must use to form the final report. It is the archaeologist's special prejudice to base his or her picture of the past on the information provided by clues excavated from the site. After the archaeologist has drawn conclusions from the data, that information will be compared with other sources. In this way, historical documents and archaeological findings complement each other.

Interviewing grandparents about an old site adds detail and color to research notes.

ORAL HISTORY

STEPS OF THE INTERVIEW PROCESS

Contact the interviewee

Explain the "program" to the interviewee

Prepare interview outline and questions

Practice with the tape recorder beforehand

Remind the interviewee of the appointment

Set up the equipment

Begin the interview: establish rapport
take notes
close the interview

Send letter of thanks

Reference:

Baum, Willa K. Oral History for the Local Historical Society. American Association for State and Local History, 1400 8th Ave. South, Nashville, TN 37203, 1971.

Tips for Interviewers

1. An interview is not a dialogue. The whole point of the interview is to get the narrator to tell his story. Limit your own remarks to a few pleasantries to break the ice, then brief questions to guide him along. It is not necessary to give him the details of your great-grandmother's trip in a covered wagon in order to get him to tell you about his grandfather's trip to California. Just say, "I understand your grandfather came around the Horn to California. What did he tell you about the trip?"

2. Ask questions that require more of an answer than "yes" or "no." Start with "Why, How, Where, What kind of. . . ." Instead of "Was Henry Miller a good boss?" ask "What did the cowhands think of Henry Miller as a boss?"

3. Ask one question at a time. Sometimes interviewers ask a series of questions all at once. Probably the narrator will answer only the first or last one. You will catch this kind of questioning when you listen through the tape after the session and you can avoid it the next time.

4. Ask brief questions. We all know the irrepressible speech-maker who, when questions are called for at the end of a lecture, gets up and asks a five-minute question. It is unlikely that the narrator is so dull that it takes more than a sentence or two for him to understand the question.

5. Start with non-controversial questions; save the delicate questions, if there are any, until you have become better acquainted. A good place to begin is with the narrator's youth and background.

6. Don't let periods of silence fluster you. Give your narrator a chance to think of what he wants to add before you hustle him along with the next question. Relax, write a few words on your notepad. The sure sign of a beginning interviewer is a tape where every brief pause signals the next question.

7. Don't worry if your questions are not as beautifully phrased as you would like them to be for posterity. A few fumbled questions will help put your narrator at ease as he realizes that you are not perfect and he need not worry if he isn't either. It is unnecessary to practice fumbling a few questions; most of us are nervous enough to do that naturally.

8. Don't interrupt a good story because you have thought of a question, or because your narrator is straying from the planned outline. If the information is pertinent, let him go on, but jot down your question on your notepad so you will remember to ask it later.

9. If your narrator does stray into non-pertinent subjects (the most common problems are to follow some family member's children or to get into a series of family medical problems), try to pull him back as quickly as possible. "Before we move on, I'd like to find out how the closing of the mine in 1898 affected your family's finances. Do you remember that?"

10. It is often hard for a narrator to describe persons. An easy way to begin is to ask him to describe the person's appearance. From there, the narrator is more likely to move into character description.

11. Interviewing is one time when a negative approach is more effective than a positive one. Ask about the negative aspects of a situation. For example, in asking about a person, do not begin with a glowing description of him. "I know the mayor was a very generous and wise person. Did you find him so?" Few narrators will quarrel with a statement like that even though they may have found the mayor a disagreeable person. You will get a more lively answer if you start out in the negative. "Despite the mayor's reputation for good works, I hear he was a very difficult man for his immediate employees to get along with." If your narrator admired the mayor greatly, he will spring to his defense with an apt illustration of why your

Baum, Willa, ORAL HISTORY FOR THE LOCAL HISTORICAL SOCIETY, Nashville, TN. American Association for State and Local History, 1969.

along with, your remark has given him a chance to illustrate some of the mayor's more unpleasant characteristics.

12. Try to establish at every important point in the story where the narrator was or what his role was in this event, in order to indicate how much is eye-witness information and how much based on reports of others. "Where were you at the time of the mine disaster?" "Did you talk to any of the survivors later?" "Did their accounts differ in any way from the newspaper accounts of what happened?" Work around these questions carefully or you can appear to be doubting the accuracy of the narrator's account.

13. Do not challenge accounts you think may be inaccurate. Instead, try to develop as much information as possible that can be used by later researchers in establishing what probably happened. Your narrator may be telling you quite accurately what he saw. As Walter Lord explained when describing his interview with survivors of the *Titanic*, "Every lady I interviewed had left the sinking ship in the last lifeboat. As I later found out from studying the placement of the lifeboats, no group of lifeboats was in view of another and each lady probably was in the last lifeboat she could see leaving the ship."

14. Do tactfully point out to your narrator that there is a different account of what he is describing, if there is. Start out "I have heard . . ." or "I have read. . . ." This is not a challenge to his account, but rather an opportunity for him to bring up further evidence to refute the opposing view, or to explain how that view got established, or to temper what he has already said. If done skillfully, some of your best information can come from this juxtaposition of differing accounts.

15. Try to avoid "off the record" information—the times when your narrator asks you to turn off the recorder while he tells you a good story. Ask him to let you record the whole thing and promise after further consideration. You may have to erase it later, or he may not tell you the story at all, but once you allow "off the record" stories, he may continue with more and more and you will end up with almost no recorded interview at all. "Off the record" information is only useful if you yourself are researching a subject and this is the only way you can get the information. It has no value if your purpose it to collect information for later use by other researchers.

16. Don't switch the recorder off and on. It is much better to waste a little tape on irrelevant material than to call attention to the tape recorder by a constant on-off operation. For this reason, I do not recommend the stop-start switches available on some mikes. If your mike has such a switch, tape it to "on" to avoid an inadvertent missing of material—then forget it. Of course you can turn off the recorder if the telephone rings or someone interrupts your session.

17. Interviews usually work out better if there is no one present except the narrator and the interviewer. Sometimes two or more narrators can be successfully recorded, but usually each one of them would have been better alone.

18. Do end the interview at a reasonable time. An hour and a half is probably maximum. First, you must protect your narrator against over-fatigue: second, you will be tired even if he isn't. Some narrators tell you very frankly if they are tired, or their wives will. Otherwise, you must plead fatigue, another appointment, or no more tape.

19. Don't use the interview to show off your own knowledge, vocabulary, charm, or other abilities. Good interviewers do not shine; only their interviews do.

Assignment VI

Name: _____

Experiential Learning Activities
"Out-of Classroom"

Explain in detail, two of your ideas for "out-of-classroom experiential learning activities" that relate to content you presently teach.

- what the activity is
- whc it's for
- how long it takes
- purpose
- how it relates to present content
- barriers to doing

DESIGNING EXPERIENTIAL CURRICULA

by JED WILLIAMSON

Public schools can involve students, parents, community and school board in the design of experience-based learning. The author describes one such program, The Mt. Cardigan Environmental Unit.

The purposes of this article are first to provide a framework which contains what I believe are some essential understandings for allowing one to think experientially, and second to suggest some strategies for implementing activity-centered and community-based curricula within a typical public school context.

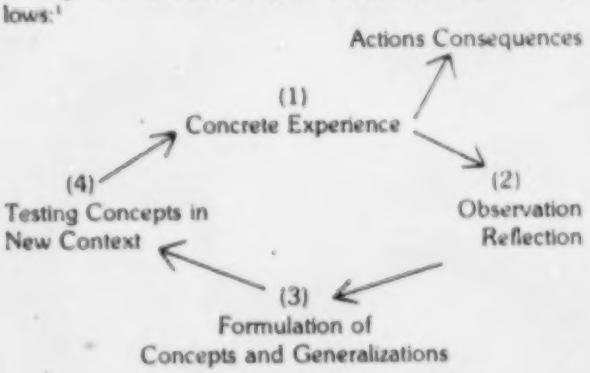
The Framework

Among the goal statements in every school district with which I have come in contact can be found tenets upon which the experiential process is based. These goals include the following, usually stated in this format:

- to provide students with the skills necessary for coping with a changing world;
- to teach students how to solve problems;
- to provide students with challenging and real learning experiences;
- to meet the individual needs of students;
- to help students learn how to communicate effectively with each other;
- to prepare students for living in a society founded upon democratic principles.

It is not essential for the purposes of this article to list those goals which specifically pertain to "demonstrated competence" in basic skill areas, although they must be addressed through the curricula. Keeping all of these goals in mind, I will state the framework for learning experientially, be it for a 40 minute class, an eight-week unit, or an entire year. First, (1) the learners must be placed in a problem situation which calls for individual or cooperative actions; these actions and their attending consequences are then (2) observed and reflected upon, and from these reflections the learners (3) review the appropriateness of their actions and attitudes and postulate what changes might be desirable in a similar problem solving situation. Then, (4) learners are placed in a new problem solving situation in which to test any desirable changes.

Diagrammatically, this cycle can be represented as follows:[1]



To foster this process in any school setting, certain preconditions are desirable. Generally, the faculty would view the school building as primarily the place where steps two and three occur. The direct, concrete learning experiences would take place as much outside of school as inside school. Additionally, the faculty would view the role of the teacher as being the problem poser rather than the problem solver, as someone who establishes clear objectives which focus as much on what is happening, and how, as on content. In short, the teacher is a process expert as well as a subject matter expert. The concern is to help learners

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[1] This diagram is a combination of ideas taken from models of experiential learning by James Coleman, et al. in "The Hopkins Game Program: Conclusions from Seven Years of Research," *Educational Researcher*, August 1973, and David Kolb, et al. in *Organizational Psychology*, Englewood Cliffs, NJ: Prentice Hall, 1974. The groundwork was done by John Dewey, as stated in his *Experience and Education*, New York: Collier Books, 1963, and by Kurt Lewin, in *Field Theory and Social Science*, New York: Harper, 1951.

achieve a personal high standard of comprehension and perception of their outside world and inward lives. The school curriculum would have an emphasis on integrating disciplines, and, thereby, for collaborative teaching. With interdisciplinary units and a core of faculty working with one grade or one group of students, the 45 or 50 minute class period could be shortened or lengthened, and class sizes could vary according to need. Learning situations would stress involving students physically, mentally, and socially in direct, active experiences.

Designing Experiential Units

Whether one teacher wants to devote fifteen minutes a week to experiential learning or a team of teachers wants to develop a ten-week interdisciplinary unit using an experiential approach, the process for design and implementation is the same. The following three tables are illustrative of how this process is accomplished in the Live, Learn and Teach program. Table A, "A Checklist of Factors in Planning for Experiential Learning — A Planning Format," is a fairly typical lesson planning format, while Table B is a very specific and detailed expansion of Step IV, "The Planning Process," from Table A. Table C is but one method of determining if a given unit meets the criteria for experiential learning. In keeping with the goal of involving learners, all three tables should be viewed as instruments to be used by both teachers and students.

Table A: A Checklist of Factors in Planning for Experiential Learning — A Planning Format

I. Theme of the plan
   Rationale including overall purpose
   Desired results
      Cognitive
      Affective
      Behavioral
II. Resources and needs
   Personnel
   Materials and geographic locations
   Budget
III. Logistics
   Dates and Places
   Transportation
   Emergency procedures
   Permission/medical requirements
IV. Planning Process (See Table B for detail.)
V. Assessment procedures for student learning (consider pre- and post-test/assessment)
VI. Journal observations and conclusions

Table B: This is a sample of how the Planning Process in Table A, Item IV, might appear for a beginning lesson on orienteering

IV. PLANNING PROCESS

OVERALL PURPOSE: A growing sense of competence in dealing with the environment

ACTIVITY: Orienteering
DATE:
NAME:

RESULTS	PROCESS	PROCESS CHECK
What the learner-centered teacher seeks to accomplish. Think in terms of affective, cognitive and behavioral growth. 1 -reduce potential threat -remove mysterious aspects -create a sense of comfort ease -gain attention of learners 2 -provide sense of all learners becoming involved -provide initial success experience -provide acquisition of skil in reading compass, setting compass dial	What actions the learner-centered teacher takes to achieve the desired RESULTS. Consider also resources, logistics, and budget. 1. Introduce activity by: (10-15 min.) -Holding up grapefruit as representation of world -Describe where poles and magnetic pole are located -Describe characteristics of compass while handing out compass (one for every five) -Break into small groups (4-5 each group) 2. Go to point from which prearranged sitings have been made and -Have groups together -Have them turn dial to 42° and site most significant object in distance -Have them turn dial to 203° and do same -Continue above process until learners have "got it" 3. Pacing and distance 4. Short course 5. Larger course 6. Post activity discussion	What behaviors during the PROCESS will verify if the activity is succeeding or if any adjustments in actions are needed. 1. Are learners exhibiting ease, understanding? (Look for relaxed facial expressions, physical proximity, minimal movement. Listen for relatedness of questions and conversation.) 2. -Are learners in small groups with friends or strangers? -Are all individuals involved with task? -Are learners siting correctly?
EVALUATION How many of the desired RESULTS were attained? How much of the OVERALL PURPOSE was achieved? Which teacher actions must be changed to achieve the desired RESULTS?		

Table C: Sample of an Experiential Class Assessment Format

1. This class had the following experiential components (on a scale of 1 to 10):

   ____ students actively involved — physically
   ____ students actively involved — mentally
   ____ students actively involved — socially
   ____ teachers actively involved
   ____ teachers set up problem
   ____ others

2. The teachers (on a scale of 1 to 10):

   ____ were well organized
   ____ were aware of students' abilities
   ____ were aware of students' concerns
   ____ made good use of resources
   ____ made good use of time
   ____ communicated well with students
   ____ were enthusiastic about what they were doing
   ____ did not get between the students and the learning situation
   ____ other:

3. The students (on a scale of 1 to 10):

   ____ liked the lesson
   ____ understood the lesson
   ____ were fair to the teachers
   ____ cooperated with each other
   ____ learned something
   ____ other:

4. The things I liked most about this class:

5. Something which could be improved:

6. Something I did not like or which made me uncomfortable:

As an example of what is possible in a typical American public school, I will describe how an eight week interdisciplinary unit, the Mt. Cardigan Environmental Unit, emphasizing a study of the natural environment has been developed over the past six years at the McKelvie Middle School in Bedford, New Hampshire. As a supervisor of graduate interns in that school for the past several years, my first-hand experience has shown that the usual roadblocks and constraints, such as lack of money, community involvement, or support, can be surmounted.

In its current stage of development, the unit works in the following manner. During the late spring, parents of seventh grade students and the students themselves are given a presentation and description of the unit. This occurs at an evening meeting, with teachers and administrators present, and includes video-tape and slide presentations, a question and answer session, and information handouts. Over the summer, the eighth grade teachers finish the current year's revision of the Field Study Manual, which becomes the guide book for each student throughout the unit. This guide book contains a great variety of problems to be solved, with considerable latitude for each student to identify his or her own particular area of inquiry. The manual is meant to serve as a journal, as a guide to inquiry, as a means to record observations and as an aid to posing and solving problems.

For the first six weeks of school, all eighth grade students (the number has ranged from 125 to 160) and their teachers prepare for a week of investigation and exploration on and around a mountain in northern New Hampshire. The skills which the youngsters learn prior to the trip include water testing, soils testing, flora and fauna identification, mapping, orienteering, archeology, camping, first aid, weather observation and prediction, food preparation, and photography. All of these skills are taught through actual field problems set up in the school, on school grounds, and in the community. Steps one, two and three of the experiential process are engaged in daily, with step four presenting a real and immediate prospect in mind. From the first day of school, students work in groups of twelve with at least one adult in each group. School subjects such as physical training, writing, and social studies are integrated as a result of the kinds of problems that must be solved throughout the unit.

By the time students embark on their trip to the mountain, they have encountered in a direct and personal manner the problems they will be solving in the new setting. Although the students are structured into activities such as a beaver pond study, a plant succession observation, an archeological dig in an old farm house cellar hole, and a stream flow study, there is also an individual focus which each student has chosen, and which will result in a culminating project synthesized during the final week, then presented to parents and the communtiy. Such projects have included making scale models of the 25 square mile study area, picture displays, written and pictorial reconstruction of farm life 200 years ago, a video-tape production depicting the entire unit, flora and fauna guides for the area, and a booklet designed to help other teachers and students start such a unit. All but a few students choose to work on these projects collaboratively. Teachers and students assess whether learning goals have been met both by the projects and the continuing work in the Field Study Manual.

It is hoped this brief sketch of a fairly complex unit will give the reader one indication of the kind of experiential approaches possible. In addition to the pre-conditions stated at the end of the first section, some specific details need attention. These details are revealed through the following interview, which Greg Kniseley, a graduate student intern, conducted with the school principal, Robert Little:

> The science Curriculum Coordinator had the task of reviewing and revising our science curriculum five years ago (1973). Ray Landry, and the other science teacher, Dick Janelle, wanted to provide an exciting 'hands on' experience for the eighth grade class. In a brainstorming session during an eighth grade team planning period, the teachers conceived the idea of involving students, parents, and community leaders in developing an interdisciplinary unit of instruction, which has now come to be known as the Mt. Cardigan Environmental Unit. Ray also involved the Assistant Superintendent, Rod Mansfield, in the preliminary stages, and this proved to be an important step in gaining support for the idea. During the summer, Ray, with input from his peers, used the vehicle of the summer Curriculum Development Committee to have the program come far enough along in its design that first year so that it

was included as part of school district policy. As principal, I directed as much funding as I could towards the project.

As is the case in most innovative or new projects, one person really has to get turned on to an idea and then develop the plan. In this case, Ray Landry was the person. In addition to the steps mentioned, he built an evaluation model and kept the right people involved and informed throughout.[1]

Implicit in his statement are some important factors essential to the success of such a venture:

(1) The project began with a few dedicated teachers, low-key in their approach, and a principal, willing but thorough in matters of an exploratory nature, spending the time in and out of school to launch the project, taking care to involve all of the necessary people.

(2) The teachers began with modest, step by step experiments. At first, the unit focused entirely on science and math, and did not include all teachers in the eighth grade. Year by year, the unit expanded to include the other subject areas. The current level of complexity is a healthy indication of the support and involvement of many adults in the community and of agency participation.

(3) The teachers' primary motive was to create an interesting set of learning experiences from which observable and measurable skills would generate. Like their students, these teachers have developed a keen sense of ownership of the teaching materials and the learning experiences — which is not a typical response when using prepared texts.

(4) Teachers ensured that lines of communication remained open with all the people concerned. Written information to parents, presentations to school board and community, slide and videotape documentations, student projects, parents' meetings and continual program evaluations are among the essentials.

During my five year tenure, I have observed some positive changes in attitude and involvement on the part of staff, and I believe this is attributable to the fact that the learning experience has been so obviously successful, as determined both by academic achievement and by student and teacher attitude. At this point, not only are the academic subject matter teachers involved; the nurse, secretary, home economics teacher, and physical education teachers have joined the effort. All staff have galvanized — in spite of obvious and expected differences in style and approach — around the task of preparing for the week in the mountains. It is a time they enjoy, as do the students.

Although some of the students feel that the Field Study Manual is really just another workbook to be completed, most students use it for what it is — a guide to give substance to their observations and discoveries. The blend of experiential and pencil/paper learning is achieved through necessity and natural inquiry. This is not to say that students can choose to do nothing. Rather, it is to say that there are more options than might be found if they were pursuing a curriculum in a more traditional manner.

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As to student-teacher relationships, it would be apparent to an observer that a positive tone for the school year is generated through the shared learning and living experiences.

It is encouraging to see the many schools which have developed units of a similar scope. The message which comes through from each of them is that the development of experiential approaches is limited only by temporary constraints, most of which are within the people doing the developing. As the network of teachers who are currently able to use these approaches becomes more sophisticated and as more articles on this topic are written, it is hoped there will follow a substantive increase in the use of experiential curricula.

[1] *Autumn Adventure — An Eighth Grade Environmental Experience*. Greg Knisely, et al. Published by McKelvie Middle School, Bedford, New Hampshire, 1978.

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To Simulate or Not to Simulate

by William A. Nesbitt

Scene: A psychiatrist's office

Cast: A social studies teacher on a couch, and the psychiatrist.

Teacher: "My teaching isn't going too well, Doctor, I'll have to admit. It isn't only that the kids aren't what they used to be—maybe I'm not either. They're bored, at least in my classes. There's this teacher in the department who claims the kids are turned on in *his* courses; but then, he's playing games with them—I mean literally! They're called simulation games. Well, that's one way to get in with the kids; if you can't lick'em, join'em. A couple of my students asked me why we don't play games too, and I said that we have more important things to do.

"And frankly, Doctor, I'm a little scared about using games. I'm afraid I might botch up the game and lose what respect I still have. And how would I handle a bunch of kids shouting and running around? How do you get them back to work after they've spent a week playing games? What am I supposed to be—a cruise director or a history teacher with an M.A. and a helluva lot to offer the kids? I know they have fun, but do they really learn anything, except how to be shrewd strategists and win? I'm not sure I'm ready to give up yet."

Psychiatrist: "Hmmm...."

Many teachers do have such doubts about using simulation games but don't feel the need to go to a psychiatrist. Their doubts cannot simply be dismissed out of hand, as they too often are, by the *aficionados* of simulation. Some fears are quite realistic, at least for some teachers in some situations. There are, for example, classes which will not take serious games seriously enough to make them work. Some teachers do not feel comfortable with games (there may be ways for them to handle this, as will be discussed later). And, some games really don't teach very much while others might reinforce undesirable attitudes.

But Game A is not Game B. One should no more condemn simulation games as a genre, from a few unsuccessful examples, than one should condemn the use of movies as a teaching device because some movies are lemons. Moreover, it can also be argued that a bad game (or movie) can be used to good advantage as an object for sharpening students' critical skills. For example, a class might undertake to redesign a bad game by changing the values of what is exchanged among the participants, altering outcomes, changing rules, adding roles—essentially trying to make the simulation conform more to reality. Such a process can teach a great deal, even if the revised game is still not completely successful.

However, before considering the benefits and dangers from their use in the classroom, we must be sure that we have a clear idea of what we mean by simulation games.

WHAT ARE SIMULATION GAMES?

People often loosely refer to the kind of games being used in social studies classrooms as "simulations," or as "games." The most descriptive and accurate term is to combine the two words—simulation games; this suggests both major characteristics.

Model of reality. First of all, such classroom activities are similar to or simulate a situation, event, or system in the real world, either past, present, or projected. It helps to think of a simulation as a working model of reality. The real situation cannot be brought into the classroom; it is too big and complicated, too far away, occurred in the past or may occur in the future. As in the case of a physical model, like a model airplane, a simulation game usually reduces the situation to manageable proportions and strips highly complex matters to those essentials needed for certain learning objectives. For example, the game of **Legislature** does not attempt to include all aspects of the American legislative branch but chooses to focus upon the process of logrolling. Other simulation games have dealt with the Constitutional Convention (**1787**), the Korean War (**Dangerous Parallel**), managing a planet (**The Planet Management Game**), and life in a black ghetto (**Ghetto**).

Simulation games used in social studies classrooms always involve role-playing by the students; that is, students take the parts of people, whether they be leaders of nations, hustlers, parents, or inhabitants of a spaceship. They step into someone else's shoes and become that person for a period of time. Through negotiation, bargaining, decision-making, and other activities, depending upon the simulation, the model comes to life and, it is hoped, mirrors reality. The students, in their roles in the simulated environment, may even have a gut-level experience of what the real thing is like.

What has been said thus far could apply as well to a mock Congress or a mock United Nations in which students play roles and operate through a model. What is missing in such mock activities, valuable as they are, is the game element. To define a game precisely is difficult. To do so in the context of a simulation may be all but impossible. But all games do involve some sort of contest or competition and many place the players in situations that lead to conflict, including simulated violence and war. In games of conflict, the players pursue incompatible goals; that is, one player's objectives seemingly cannot be achieved without threatening those of another. Goals are often, if not always, some clearly desirable resource, tangible or intangible, that is perceived to be in short supply—land, natural resources, money, prestige, etc. Such a game stresses conflict between individuals and between groups. The conflict may be "real"; that

is, about something which the parties need and want badly. In the game of **Crisis**, for example, various hypothetical countries strive for a rare element, possession of which would mean unlimited energy and a dominant position over those who did not get it. But the conflict can also be largely "unreal," based on misperception. In the **Alpha Crisis Game**, simulating the outbreak of World War I, countries may take actions viewed by themselves as purely defensive but which are perceived by others as threatening, and lead to countermeasures and an escalating situation.

Rules and constraints. It should be stressed that simulation games, as distinct from role-play exercises, require the players to operate within a more limiting set of rules and constraints. A group asked to role-play a ghetto family living on welfare is given an open-ended situation; they may do almost whatever they like. In a simulation game, the roles are assigned, the model imposes limits to actions, the objectives may be detailed, communications restricted, resources or exchanges specified, and outcomes clear, even quantified. However, because in some kinds of role-play there may be constraints, competition or conflict, and a model, as in the case of a model UN, it is not always easy to make a precise distinction. It is accurate to say that simulation games are more structured and have more of a game quality than role-playing.

Outcomes. There is a game quality in simulations for the social studies classroom but this should be carefully distinguished from conventional parlor or gambling games in which the gain of one party is the loss of another, a zero-sum. Or, as the Duchess said to Alice in *Alice in Wonderland*, "The more there is of mine, the less there is of yours." Simulation games need not be cake-dividing contests; rather there is the possibility, at least, of cooperating for mutual advantage and for enlarging the "cake" or the scarce resource. In **Guns or Butter**, countries can and frequently do get into an arms race, with accompanying suspicion, fear, and hostility; but they may also cooperate to limit or eliminate arms and build their economies through trade agreements and common markets. Or, all can lose by annihilating each other through nuclear war.

Some games do not involve players in conflict but rather in a form of parallel competition. One of the first educational simulations developed, **Life Career**, has teams of students vying with one another to advance the career of a fictitious person; the team which provides "the most successful life" for the person "wins." Similarly, in the **Planet Management Game**, teams compete to see which one can best manage the planet Clarion, controlling population and pollution and providing for economic development and adequate food.

A number of reputable game developers emphasize the importance of having clear outcomes derived from what the players do in the simulation game. Samuel Livingston and Clarice Stoll in **Simulation Games: An Introduction for the Social Studies Teacher** state, "In a simulation game, the scoring system provides rewards which depend on the results of the players' decisions. These results and the accompanying reward are made to correspond as closely as possible to those in the real situation." By the same token, failure of players to adopt effective strategies should result in losses that are clearly conveyed by the game itself.

There is a category of games where the outcome is neither programmed nor determined. Whether these are properly called simulation games or not is a matter of how rigid one is about a quantified outcome. In these games the students discuss how well they played and whether there was a "winner" or not. In the **Alpha Crisis Game** the students attempt to evaluate their own and others' actions and decisions in the light of the goals that each country had determined for itself. "Winning" in such a game usually means preventing a war in which everyone would lose in the long run, but it is up to the students to determine the criteria for successful play. In **Guns or Butter** the teacher is cautioned against having the students adopt a zero-sum, winner-loser type of thinking since all may improve their countries' positions through cooperation or all may lose through war.

The teacher should not be God. The reason why it is important that a good simulation game itself rewards play is that otherwise the teacher or some other authority will too often be in the position of deciding outcomes—of playing God. In a well-designed simulation game, the students should feel that it is the system the game is trying to replicate that produces the results. This is not to say that the students might not feel that the punishments meted out by the game were cruel and unusual and did not conform to reality, or that virtue was not properly rewarded. Indeed, one of the principal responsibilities of the students in the debriefing or follow-up is to criticize the game, perhaps changing the outcomes. But it is far better that the game rather than the teacher be put in the position of meting out justice and injustice, and the fishes and loaves of the real world.

The question of cause and effect was vividly exemplified in one play of **Guns or Butter** at a conference sponsored by the United Nations Association. Several of the countries in the game were led by strongly peace-minded people, who chose to reveal their lack of armaments as an inducement for other countries to follow suit. One of the two major countries was controlled by a student who chose to play like a Hitler, talking peace while building up overwhelming military power. It attacked the exposed countries and was victorious. In the debriefing, one of the leaders in the defeated countries vehemently asserted, "This game teaches war, not

peace!" To which the Machiavellian aggressor replied, "No, it teaches reality."

WHAT SIMULATION GAMES MIGHT DO FOR MY STUDENTS—AND ME

Let us take "me" first. Many teachers have found that using simulation games results in a far more relaxed relationship between students and teacher, with learning enhanced. In the course of the game, the teacher's role is changed to a fellow participant not a purveyor of information and grades. Thus, the teacher who hovers and scolds and worries too much about following rules to the letter may have some problems with simulation games.

"Commercial" games, or those coming from outside sources, break down barriers between teacher and students better since all can join in freely criticizing the game during the debriefing. Games that teachers have designed themselves might arouse some defensiveness or concern about feelings. This is not to imply that teachers, students, or teachers *and* students should not try to design games. But this might best be undertaken (as will be discussed below) after a more open atmosphere has emerged in the classroom through successful playing of games developed by others.

Games also enable students to view themselves and others in a new light—not necessarily always a positive one. They can hold up a mirror to their own and each others' conduct more dispassionately, and with less threat, than in "real life" outside of the game. For example, a black girl, militantly active in the civil rights movement, became one of the dominant, in-group Squares in **Starpower**. As a Square, she enthusiastically participated in devising rules to make it impossible for the less-fortunate and powerless groups to rise out of their class. When she was asked during the debriefing, "How does your conduct differ from the white establishment you so much condemn?" she replied, "I don't know. I have to think about it."

In one playing of the **Alpha Crisis Game**, the leader of Omega (Austria-Hungary) acted very aggressively, eventually declaring war against Alpha (Serbia). The result was an overpowering coalition against his own country. Later, the leader of Kappa (Germany) said, "That was stupid!" The Omegan leader did not lose his temper but replied, "You're right. I didn't see what would happen."

Provide active learning. Games are participatory activities; they teach experientially. But they are by no means simply knee-jerk learning. It might help to place games in the framework of the four-part learning process outlined by Jack Fraenkel in *Social Education* (Nov. '73). First, there is an input from reading, listening, seeing, and all the activities associated with these. Second, the incoming information must be organized by the student so that it fits into his mental filing system and makes sense in relation to what he already knows. Third, the student should be able to have some active experience with the knowledge or with the basic concepts. Finally, there should be a creative phase in which the student uses what he has learned to produce something new or different. Simulation games, when properly used in the context of a social studies course, can contribute to learning in all of these phases but especially the experiential and creative. They do involve data, some more than others; the model helps organize the data in some meaningful way; students become actively involved in playing the model; and the experience of criticizing the game, perhaps changing the values and outcomes, even writing a new game, is creative.

Simulation games can teach basic concepts and this is surely a key rationale for their use in the classroom. If you want students to understand the meaning of social classes and how a dominant group tends to behave, **Starpower** might be worth many pages of reading or lectures. If you want to get across the concept of an 18th-century international system with fluid alliances, the first part of **The State System Exercise** is quite effective. If you want to teach the major elements in foreign policy decision-making, **Dangerous Parallel** can accomplish this in ways that more traditional approaches cannot. However, and it cannot be repeated often enough, learning does not stop with the game; in a sense it really begins as the students reflect, in the debriefing, on what has happened and as they use the post-game input of more conventional sources to expand upon and reinforce what they have learned.

Reward untapped abilities. Simulation games also teach and reward certain skills and talents that are too often neglected, or at least not measured, in ordinary classroom activities. Leadership, for example, can often come to the fore from students who are not academically successful. One student, barely passing in most of his courses, was outstanding as a leader in playing **Guns or Butter**. And, while still in high school, he became much in demand for demonstrating games with students and at teacher-workshops in many localities. This leadership talent played no small part in his later going on to college.

Again, depending upon the game, students may also learn something about planning ahead, allocating resources, and adopting strategies to achieve an objective, whether that be a desirable career goal (**Life Career**) or a foreign policy objective (**Inter-Nation Simulation**). They can learn to count costs in terms of benefits; and, as they pursue goals and recognize the need for methods of persuasion, they begin to value the skills of marshalling facts and arguments, public speaking, and negotiating. They also learn the importance of doing the game "homework," following

directions, and listening to what is being said by others—to be inattentive in a game can be costly.

Although games are often competitive, they can also be exercises in cooperation. Leaders of a nation, for example, may try to go it alone only to find themselves ousted by their fellow ministers. Countries which try to go off in splendid isolation may find that they have no security or cannot improve their economic position. Or states which are uncooperative may find themselves in a war that could have been avoided by alliances or by helping form an international organization. Indeed, in international simulation games, cooperation is usually a built-in value that the students are not given but must discover—or pay the penalty.

Motivate? The research on what games do is inconclusive, except for particular games that have been tested. One thing is certain—students generally enjoy the experience and this is no small achievement these days, as schools cope with boredom and dropping out. While not all students would respond the way this one did after playing a simulation game, the reaction is by no means unique: "With the game a person can get a better understanding of the lesson than by the teacher teaching it. With the games you understand what was going on. And once you learned the rules of the game you could learn the facts better and faster. You didn't have a teacher standing over you talking a lot of stuff you really wasn't interested in and they weren't making interesting. With the games you learned the work as well as having fun in doing it." (From Livingston and Stoll, p. 10.)

QUESTIONS ABOUT SIMULATION GAMES

Simulation games are by no means a panacea for what ails American education, nor will they solve in any significant way any serious shortcomings of a particular teacher or student. Games are but one arrow in the quiver of the social studies teacher. They cannot become more than that. As one simulation expert has said, "The game itself isn't the teacher, it's just an instrument the teacher uses to get something done. . . . A game . . . is something you can use with classroom materials and arguments and standard teaching techniques, and get some teaching done in a somewhat different mode, and keep people awake, but it isn't a curriculum, or instant intelligence in a box. . . ."

Are they practical? Some reasons why simulations are not used more than they are—and by many teachers who are favorably disposed toward them—may be grouped under the word "practicality." For one thing, they require too much time. Many games will take a week or more of classes to prepare for, run, and debrief. This means cutting out some of the content of an already squeezed curriculum, and for many teachers it might mean short-changing some students who must take a College Board Examination of the material covered. There is no denying that simulations require time and that they reduce "coverage." In deciding to use simulations the teacher is often faced with a difficult trade-off of content for enhancing student interest and teaching certain skills, concepts and processes, such as decision-making.

There are other practical obstacles to using simulations that need only be touched on here because many are too specific to particular games. One is that simulations require changes in physical arrangements (chairs, tables, additional room, etc.) and sometimes necessitate finding additional paraphernalia (such as an adding machine)—all of which can be time-consuming and frustrating to the already overworked teacher. Such objections apply more to the exceptional game. Most classroom simulations, by definition, are designed to fit into the usual school situation. Generally games do require movable furniture, hardly an insurmountable problem these days; and while many will work in the ordinary-size classroom, a larger area is preferable—a school cafeteria, gymnasium, or team-teaching room.

How about slow learners? Another criticism is that games are all very well for the bright students but not for the average or below average. An occasional teacher using games for slow learners has been disappointed with the results although most have been enthusiastic. Data suggests that the interest of low ability students is increased by playing a simulation game but their conceptual understanding (seeing analogies with reality, for instance) is not improved, which is hardly surprising.

How about underachievers? Dale Farran in her work with underachievers at the North Carolina Advancement School has played even world crises games "that challenged their intellect, that taught them about the real world. They were involved, they were excited, they were having fun." Again, generalizations about success are risky, for it all depends upon such factors as the game, the social and academic mix of students, the number in the class, the teacher, etc.

Do they transform people? Other criticisms are of a broader nature and call into question whether simulation games have any significant effect upon the cognitive and, especially, affective domain; or, if there is an effect, whether it is positive. The test data on the effects of simulation is incomplete and often contradictory, but it seems fair to say that playing a game does not change

students' strongly-held attitudes, beliefs, and feelings. They do not turn the aggressive personality into the benign, the hawk into the dove, the thoughtless into the empathetic, the irrational into the rational—although they may make a dent, at least for the moment. Research with **Ghetto**, for example, indicates that "players held more favorable opinions about poor people after playing the game but that this effect of the game was temporary." (For the best, brief overview of research on games, see Livingston and Stoll.) Garry Shirts, designer of some of the best known simulation games, has succinctly given his impression of the affective domain: "It seems unreasonable to me to expect that a two to ten-hour experience or even a series of such experiences would be able to change the self-concept, personal values, and beliefs which have grown out of one's many thousands of different work experiences, personal encounters, television shows, books, discussions, and so forth. Psychiatrists have not been able to demonstrate that they can make changes in a person's psyche with hours or even years of intensive therapy."

By the same token, of course, one should not take too seriously the fear that games, of themselves, will produce undesirable behavior. One student said that nothing was learned by playing an economics game "except how to swindle people." It is fair to assume that playing the game will not turn this student from a presumably honest person into a swindler.

Do games teach factual content? There is some evidence that games, at least those tested, do not teach facts as well as other methods of teaching. Indeed, games that require students to amass a great amount of information can result in students being as turned off by the game as by reading materials, especially if their expectations were for some fun in playing a game. However, students do need certain information for playing almost any game and that necessity may be the mother of learning as much as of invention. But, there is also evidence that students are not motivated to plunge into fact-oriented materials after playing a game, even if the experience was enjoyable. This depends upon the students, the teacher, the game, and the kind of materials and approaches that the game leads into.

Some simulation games serve as a sanction to players for letting off steam. If enough students have aggressive feelings to vent, this can lead to self-examination and even peer group disapproval. But the experience can also turn into a brawl in which serious learning is impossible. A class that is incapable of playing seriously, with reasonable constraint and according to rules, may not benefit from simulation. Similarly, some games may stimulate resentments felt by the group; **Starpower**, when played with deprived minority students, has resulted in students refusing to play and even in fist fights.

Are simulations too simplistic? One of the most commonly heard criticisms of simulation games is that students do not and obviously cannot experience the real consequences of their decisions. After they have made mistakes or miscalculations in the game, they cannot go to jail, starve, or bleed. As Ralph Frick, Professor of Elementary Education at the University of Atlanta, writes in *Teacher* (Dec. '73): "The consequences of each decision are likely to receive no more than usual attention, if any at all."

This criticism is a variant of the often expressed view that games are at best a crude approximation, sometimes no more than a caricature of reality. It is claimed that students playing such roles as leaders of nations and managers of planets are encouraged to think that problems are simple and can be solved by a speech, a treaty, an instantaneous "decision." Professor John Burton, of the University of London, has called simulation games downright dangerous, engendering a simplistic arrogance in the young.

Such arguments are well-intentioned and often well-taken. It is possible to whip up a simulation, like a cake mix, and play with simulated people, like toys. Too often, serious games may be used for a rainy day diversion or a change of pace with little or no surrounding material, critique, or post-game follow-up. But critics often exaggerate the power of a game to transform a student into a person harboring dangerous views of the world. They also fail to realize that most game designers are not naive or irresponsible. They know that simulation games must be debriefed thoroughly; the game alone is not enough. To paraphrase Socrates' famous comment on life, the unexamined game is not worth playing.

DEBRIEFING

A simulation game is usually an exciting experience. Students have been caught up in a situation, a slice of life. For a period of time the classroom was transformed into a stage on which they were actors in a life-like drama. Frequently, the players had to respond to a crisis that required negotiations and decisions made under the pressure of time. They may have misperceived the intentions of other teams, taken gut-level actions, and experienced results that frustrated strategies and goals. The debriefing is a time when the students come together after the last round, to mull over the game calmly, to try to determine what it meant, and to milk it for its significance.

What happened? The debriefing can be divided into several phases. First, students and teacher may consider what actually happened in the game; this may not be easy to determine. Sometimes it is useful to have every student keep a daily

"diary" to aid memory. Teams may need to inform each other of what they did in secret meetings and why. The teacher might have to ferret out turning points of the game that may not have been evident to participants. The students may need to discuss such questions as: What strategies seemed to be most effective in the light of their own goals? Which did not work? Were risks taken that had, or might have had, serious results? They might want to take up the cause and effect relationships in the game: What were the causes of particular results? In many games, "winners" and the criteria for "winning" must be determined. Was "winning" so costly as to be of questionable value? Were there, in fact, no "winners"? Was the game one in which everyone could "win"? Or was it a zero-sum kind of game in which the gain of one team was the loss of another?

The "reality gap." A second phase of debriefing involves determining the extent to which the game mirrored reality. Every game is unavoidably a model of reality, a slice of the real world writ small. How serious was this "reality gap" (Garry Shirts' words)? Students generally do not know enough about what was simulated to be able to match up the game world with the real one; their conclusions need to be put in the form of tentative hypotheses that can be tested out in follow-up materials. Indeed, what happened in the game should rather serve as a springboard for inquiry about reality. It should be heuristic, stimulating ideas and theory for further examination. For example, **Starpower** can lead to the conclusion that human nature is selfish and exclusive; but a responsible teacher using the game would inquire into whether such behavior has something to do with our values, leading to real questions about culturally-derived versus innate behavior.

Discussion of the reality gap should take up the question of whether action choices in the game were realistic. In a few hours no game can create an environment that closely approximates that in which real decision-makers must operate; an international conflict simulation cannot replicate the numerous factors that national leaders must, or at least should consider. In some games students can blithely go to war, for example, and ignore the constraints and penalties felt in the real world. They do not have to see cities destroyed and the dead and dying; however, the debriefing and follow-up activities should arouse their empathies. Also, the post-game discussion may evoke the wrath of the students who were the object of the aggressive actions. Perhaps nothing is as effective as peer group disapproval of the behavior of some students.

Discussing values. Games do raise important value questions, and these should be dealt with in the debriefing. The simulation itself may seem to be imbued with a particular set of values. A game may seem to be saying that war under any circumstances is wrong. Or that an increasing Gross National Product is always a positive value. Also, students may feel that they were obliged to take roles or actions that were contrary to cherished values. The teacher needs to help such feelings surface and then have them discussed fully, perhaps asking such questions as: Did you really have to violate what you think is important or right? What would have happened in the game if you had done what you wanted to do? Would the outcome have been negative? Would this be true in the real world?

Rewriting the game. At least for some classes of able students a final part of the debriefing might raise questions about how the game could be changed. How could the game be made more realistic? If the penalties or rewards were increased, what would happen? What if the resources available to the teams were altered? What if some new element were introduced into the game? What if the game were put into the future? For example, a crisis game might be set in the year 2000 with a strengthened United Nations. The class might revise the game, or even design a new one, and play it with another class.

GETTING STARTED

Not many years ago the problem was that there were so few games from which to choose. Now the problem is choosing a game from among dozens, if not hundreds. Of course, the selection is narrowed down by the fact that a teacher is looking for a game to fit into a particular course at some appropriate point. If the course is American history, for example, one might look into such subject areas—in addition to history—as political science, civics, economics, urban problems, or race relations. Social studies courses in the junior high or middle school level might lend themselves more to games dealing with anthropology or geography. It is probably more desirable to narrow the field of simulation games by broad subject area than to set out looking for a particular game to teach a single concept or topic, since a good one might not exist. Or, put differently, the teacher might look for a demonstrably effective game for a course and start with it rather than choose just any game that happens to fit a pet project.

Another criteria for selection ought to be that the teacher has some confidence that the game might be more successful in teaching the topic than what has been used. For example, if in a course that deals with race relations, poverty, and urban problems the teacher suspects that students are not gaining an adequate understanding of what it is like to live in a ghetto, then the **Ghetto** game might be well worth using.

Choosing a game. How to go about finding the right game? There may be no substitute for personal contact with other teachers who have been using simulations, so that one can draw upon their experiences. If such teachers do not exist in the school system or if it is felt that more expert help is needed, it is often possible to talk with experienced simulators at local, state, and national Social Studies Council meetings who are conducting workshops, clinics, and sessions. Also, each issue of the **Simulation/Gaming/News** contains articles by and about people using and developing games. The editors and contributing editors of this valuable periodical are among the best-known experts in the field and would welcome personal requests.

A number of books, articles, and bibliographies can provide extensive information about games and how to go about selecting the right one. (See bibliography below.) Fortunately, annotated lists of simulation games are now available. The most extensive, almost indispensible now, is **The Guide to Simulation/Games for Education and Training** by David Zuckerman and Robert Horn (see Key Sources in bibliography). While the price of $17.00 may seem steep, this work gives information that is not easily acquired elsewhere.

Another useful guide is **Learning with Games**, edited by Cheryl Charles and Rod Stadsklev (see Key Sources in bibliography).

At least two materials distributors (see bibliography) have many games in stock that can be ordered at list prices and each publishes a free catalog with descriptions of the games available. Educational Manpower, Inc., has the more extensive selection, while the Social Studies School Service catalog also includes books on simulation.

DOING YOUR OWN GAMES

There is common agreement that the ultimate learning and teaching experience occurs when both teachers and students develop their own games (the same might be said about the value of teachers and students writing their own textbooks). There are even teachers who would not touch a "commercial" game with a ten-foot pole, but such purists are either exceptional people or engaging in "teachmanship." Surely even a gifted poet would not teach English literature using only his own poems, except, possibly, in a graduate seminar.

As we have said, designing a role-play exercise with some of the earmarks of simulation is not difficult. A good game is much harder. To design a first-rate simulation game is harder still. Not only perspiration but inspiration, given to few, is needed. Yet, if it is true that to play a bad game can be made productive by providing an object on which students can sharpen their critical wits, a "homemade" game can be even more useful.

However, circumstances may make self-made games more of an ideal than a feasible possibility for most teachers. One highly successful game designer has said that "very few people are ever going to be in a position to design a game. . . . They haven't got the time, the energy, or the resources, or the audience to try them on, and there are very few teachers who are capable of teaching people how to design a game."

In any event, the teacher who is unfamiliar with simulation games but interested in game design probably should start with "store-bought" games. Experience with these will suggest the basic structure and ways of handling the dynamic aspects. Since this article is for the uninitiated, it will omit what would have to be a lengthy introductory discussion of how to design a game. Indeed, such a discussion might even have detrimental effects by suggesting that there is a clearly established set of characteristics and rules to follow. Some of the most exciting games, like great novels, poems, or pieces of music, do not follow the accepted pattern.

However, for the teacher who does want to try developing a game, there are several places to find out more. **Simulation Games** by Livingston and Stoll, two highly skilled designers, has an excellent chapter, "Designing a Simulation Game." A short book by Raymond and McLean, **Design Your Own Game**, is another useful source. Also, see the chapter, "How Students Can Make Their Own Simulations," in **The Guide to Simulation/Games**.

TO SIMULATE OR NOT TO SIMULATE

Many teachers, not only in the United States but around the world, have learned that their students are not responding to the old ways of teaching. There is a *malaise* in the classroom. Perhaps it is because the young have themselves experienced so much. Affluence has permitted many to travel more in a few years than their elders did in a lifetime. Through television they are daily absorbed in exploring the moon, the sea, and, yes, the bedroom. The commercials for such products as Pepsi-Cola know their generation when they exploit the desire for movement, action, and human interrelationships.

The social studies, especially history, have been up against it because to the young they seem remote from life and do not often involve students, although every text now has an "activities" section at the end of each chapter. Simulation games are experiential learning, to the extent possible within the confines of the four walls and what is allowed in a school. But they are not pure experience; they require information, thought, and finally reflection. Good games, when used well, are not simply interludes for fun. While they can enliven a class, they can also teach.

Things to Do, Think About, and Watch Out For

Getting the background

- Some background reading is useful, but choose items that are not technical or theoretical, at least in the beginning.
- Play a simulation game yourself, either with friends and colleagues or at a social studies conference or workshop. There is no substitute for getting the "feel" and seeing a game from the participant's perspective.
- Accept that there are different kinds of learning and things to learn. Games are not designed to teach names and dates or content; rather they teach concepts, strategic thinking, communication skills, decision-making, conflict resolution, bargaining, need to compromise, etc.
- Be prepared for a different role; that of facilitator and fellow inquirer—not Authority figure.
- Expect some confusion, loose ends, improvisation, and noise, at least in some games.

Choosing a game: some guidelines

- How will the game fit into a course? Will it support surrounding activities?
- When can the game be used with adequate debriefing and follow-up, perhaps considering winter doldrums and vacation periods?
- Is it going to be interesting and not too hard or too easy?
- Is it realistic, keeping in mind that all games simplify reality?
- Are the penalties and rewards from action choices provided in the game or does the teacher have to play God? What role does chance play?
- Can all the students get into the act, or do some have little to do? Keep in mind that some games can use student helpers as "Control," messengers, calculators, etc. Also, the class might be divided, one group playing while the other does something else. Or, key roles can be doubled up, obviating problems from absenteeism.
- Can the game be played effectively during class periods? If not, can students be gotten together after school or on a Saturday?
- Can the game begin so that a weekend does not seriously interrupt continuity?
- Are there the necessary physical arrangements? Is the classroom large enough? If not, is there a quiet gym or cafeteria available without conflicting with other activities? Are tables, an overhead projector, a chalkboard, etc. needed?

Playing the game

- Play the game first with friends or colleagues. If possible, include student helpers in the trial run. Older students might be given major responsibilities, even running the game.
- Are you ready to start? Are the rules mastered? Are game materials ready to be distributed? Can some materials be reproduced so that everybody has a copy, if the game does not provide them? Are there plenty of forms, if they are needed?
- Have you arranged for assigning roles? Should these be given out at random, to avoid students wondering why they got what they did? Or, should they be assigned to insure leadership where needed?
- Keep the introduction brief. Let the students discover strategies.
- Do not worry about whether participants have learned every rule, lest interest wane. Some rules can be learned in the course of play.
- In timing rounds, especially in the beginning, should you be flexible and "play it by ear"? When strict timing is desirable, a kitchen timer can avoid pleas for "just one more minute."
- Don't hover and coach. Let students make mistakes and profit from them.
- Be prepared to improvise, for something may go wrong or the unexpected may happen.

Debriefing and follow-up

- Debriefing is essential; indeed, failure to debrief adequately may leave students with a distorted view of what was simulated.
- What happened in the game? What were the goals? Which strategies were effective in accomplishing those goals? Which had negative results? It is sometimes useful to have students keep "diaries" of what went on.
- What actions led to what results? What cause and effect relationship came out of the playing?
- What would have happened if the rules or values had been changed? What if the penalties or rewards had been? How would this have affected actions taken?
- How did the game compare with reality? What additional factors would have made the game more realistic? How could the game be redesigned, to be more realistic? (The discussion of the real world may require considerable follow-up study.)
- Did what happened in the game seem fair? Was this the fault of the game or the real world?
- What hypotheses about reality did the game suggest? What needs to be done to confirm these hypotheses?
- Did the game violate any of the students' values? If so, why did the students do what they did?
- Should the game be followed up with other materials, readings, films, etc.? For example, if war erupted in the game, would it be desirable for the students to see a film showing what war is really like?

Evaluation[1]

- Students should not be graded on how they played the game, since often what is learned does not lend itself to accurate evaluation. More important, if they know that grades are at stake, their behavior will be inhibited and the atmosphere will become simply another conventional learning exercise.
- Should the teacher want some written measurement of the effectiveness of a game that has been played, the students might be asked to hand in anonymous comments in which they demonstrate understanding of a concept, a change of attitude, or some other objective that the teacher hoped the game would accomplish.

[1] For a brief, but informed discussion, see Samuel A. Livingston and Clarice Stasz Stoll, **Simulation Games: An Introduction for the Social Studies Teacher** (New York: Macmillan, 1973), pp. 17-19.

TEACHER GUIDE

SIMULATIONS AND THE "NEW" SOCIAL STUDIES

In America today social studies teaching is in ferment. No longer satisfied with classroom teaching dominated by textbooks, teachers are examining course content and teaching method in the light of concepts such as the following: inductive or inquiry learning; discovery of a discipline's structure; involvement through interaction and value conflicts; learning rather than teaching. One method incorporating all of these ideas is to apply game theory to classroom instruction by constructing simulations. The following educational simulation is one of several offered by INTERACT of Lakeside, California.

PURPOSE

In DIG your classroom will become an archeological lab, filled with the type of heated discussions and questioning interpretations that characterize the discipline of archeology. Unusual and exotic artifacts will be excavated by your students using the scientific techniques employed by professional archeologists. They will record their observations and measurements on the same forms used by many museums and universities. After the artifacts have been restored and analyzed, the "ancient" civilization responsible for the remains will "return" and allow the archeologists to discover the accuracy of their findings and interpretations. While most museums have cards that explain what archeologists *think* the artifacts mean, your museum display will have additional cards that explain *exactly* what the artifacts mean. Besides experiencing how it *feels* to be an archeologist, your students will acquire the following concepts, attitudes, and skills:

Concepts

1. All people, past and present, have shaped their beliefs and behavior in the face of universal human problems and needs.
2. The various elements of any culture are interrelated and cannot be understood without examining the culture as a whole.
3. The culture of any society is constantly being altered, and a change in one element will effect changes in other elements.
4. It is difficult to examine and interpret cultures different from your own.
5. Art reflects the ideas and moods of a culture.
6. Individual effort and group success are closely interrelated.

Attitudes

1. Respect and admiration for creative and skillful craftmanship.
2. Respect and admiration for the individual capable of creative thinking.

Skills

1. The techniques of field archeology
2. The development and release of creativity

Although many of the ideas and approaches in DIG can be adapted to any level from the fifth grade through junior college, it was written as a unit for a secondary history or anthropology class. While most easily used by a teacher with some background in cultural anthropology, DIG can be utilized by anyone with social science training. If you feel lacking in the area of anthropology, the following books are highly recommended.

ANNOTATED BIBLIOGRAPHY: ANTHROPOLOGY*

Gallagher, James J., *An Annotated Bibliography of Anthropological Materials For High School Use*. New York: Macmillan, 1967.

An essential guide to the ever increasing materials available for use in secondary schools, rating books on difficulty and interest scales.

Kluckhorn, Clyde, *Mirror For Man*. New York: Whittlesey House, 1949.

Still the most readable introduction to the field of anthropology.

Pelto, Pertti J., *The Study of Anthropology*. Columbus, Ohio: Merrill Books, 1965.

Contains a chapter which suggests specific teaching methods for elementary and secondary schools.

*An Annotated Archeology Bibliography will be found on page 12.

OVERVIEW

In DIG competing teams create secret cultures. Artifacts are made that reflect these cultures. Each team buries its artifacts for the other team to excavate and reconstruct. A final confrontation reveals the accuracy of each team's reconstruction and analysis.

PHASE I – ONE WEEK

The first phase of DIG begins when the class is divided into two teams which have the challenge of creating complete cultures independent of each other. Students excitedly place their culture in a setting and time of their own choosing and decide on its values and ethics. Students next create the culture universals (government, religion, economics, etc.). Phase I ends with each team having created on paper a complete culture with all its varied components. All a team knows of the other

team's culture is the smug look of superiority and silence that greet probing questions.

PHASE II - ONE WEEK

Phase II consists of turning the ideas of Phase I into artifacts that accurately reflect the elements of the cultures. Students complete detailed artifact blueprints that indicate the universal represented, materials needed, and three-dimensional views of the object. An explanation of why the artifact is a valid representation of the universal completes the blueprint. Language experts design a Rosetta Stone to give the other team their only clue to deciphering the strange tongue. Religious experts are challenged to make plans for the secret tomb that is to contain the culture's religious artifacts. Fiendish traps must be designed to protect the artifacts from the other team's "grave robbers."

Before the actual task of artifact construction can begin, the student must go through the excruciating process of presenting his blueprint to the team for approval. After artifacts are completed, BEFORE museum cards are made which tell the exact function of the objects. During the final confrontation these will be compared with the other team's interpretations of the reconstructed artifacts.

During Phase II the students also receive instructions in the techniques of an archeological excavation. Besides learning the various tasks required and the tools needed on a dig, they learn the importance of accurate data-gathering that is the hallmark of scientific excavating. At the end of Phase II, artifacts are finished, plans for "salting" the site are ready, individual and team responsibilities on the dig are clear, tools have been obtained, and everyone is ready for Phase III, the BIG DIG.

PHASE III - ONE WEEK

Phase III finds the class in the field for a week. (The "field" is any place on or adjacent to the school grounds that can stand to have several 6' square pits excavated.) Artifacts are broken and placed in the ground according to plans developed in Phase II. The teams excavate each other's mysterious cultures, culminating with the uncovering of the "secret" tombs. As the teams cheer or hiss, the religious experts attempt to overcome the obstacles that have been devised to protect the valuable artifacts. Finishing the excavation, students return to their rooms where they piece together and restore the recovered artifacts.

PHASE IV - ONE WEEK

In Phase IV, the exciting conclusion of DIG, the teams reconstruct and analyze the strange cultures they have unearthed. Through group interaction, the teams come to final conclusions concerning the time, setting, and themes of the vanished civilizations. Individuals present their interpretations of the universals (religion, language, government, etc.) and attempt to get group approval of their ideas. The excavating team makes AFTER museum cards which contain their final analysis.

Then both teams confront each other for the first time. A team presents its findings and conclusions to the team which created and planted the culture. Depending upon the accuracy of the analysis, this is usually accompanied by much hooting and snickering. When the excavating team is finished, the team that created the culture tells all. The teams then change roles and repeat the process.

After class, the teacher sets up the artifacts in a museum display, attaching the BEFORE and AFTER museum cards that tell the accuracy of the interpretations at a glance. If desired, an Open House is held for students and parents. Students give awards for the artifacts each team feels show the most creativity and handicraft skill.

By this time, the students *know* the hard work and intellectual challenges of archeology because they have experienced the creative thinking and questioning that make archeology so unique. (Perhaps most important of all, they have been placed in a situation where creativity has been possible.)

GLOSSARY OF ABBREVIATIONS USED IN DIG

Abbreviation	Description	
AFRS	Archeological Feature Record Sheet	
AMC	After Museum Card – No. 7	
APR	Archeological Photo Record Sheet	
ARBS	Artifact Blueprint Sheet – No. 4	
ARS	Artifact Record Sheet	
ASR	Archeological Stratigraphy Record Sheet	
ASSR	Archeological Site Survey Record Sheet	
BMC	Before Museum Card – No. 5	
CAPS	Creativity-Artifact Points	
CC	Crew Chief	
CUAS	Culture Universal Analysis Sheet – No. 8	
CUS	Culture Universal Sheet	
DS	Datum Stake	
GAB	Grand Arbiter of Behavior (teacher)	
MARF	Museum Artifact Reconstruction Form – No. 6	
SI	Specific Instructions	
TGBD	Team Guide to Big Dig	
Topo Map	Topographic map of site	

Nos. in right column indicate ASSIGNMENT SHEETS

Appendix M

UNIT TIME CHART
(Intended as example; alter as desired.)

	M	Tu	W	Th	F
WEEK 1	**Phase I - Hour 1** Both teams: Introduction Culture Universals, Time, Setting, and Theme concepts (Assignment Sheet 1)	**Phase I - Hour 2** Team 1 (2 in library) Determine Crew Chief Decide on time, setting and themes Assign universals (Assignment Sheet 2)	**Phase I - Hour 3** Team 2 (1 in library) Same as Phase I - Hour 2	**Phase I - Hour 4** Team 1 (2 in library) Decide on universals (Assignment Sheet 3)	**Phase I - Hour 5** Team 2 (1 in library) Same as Phase I - Hour 4 (Assignment Sheet 3)
WEEK 2	**Phase II - Hour 1** Both teams: Collect final write ups of universals Explanation of Artifact Blueprints (Assignment Sheet 4)	**Phase II - Hour 2** Team 2 (1 in library) Check ARBS Begin artifacts Before Museum Cards (Assignment Sheet 5)	**Phase II - Hour 3** Team 1 (2 in library) Same as Phase II - Hour 2	**Phase II - Hour 4** Team 1 (2 in library) Explain Dig forms, tasks, and tools	**Phase II - Hour 5** Team 2 (1 in library)
WEEK 3	**Phase III - Hour 1** Team 1 (2 in library) Meet in field Artifacts broken and placed in ground Tomb finished	**Phase III - Hour 2** Team 2 (1 in library) Same as Phase III - Hour 1	**Phase III - Hour 3** Both teams in field The Big Dig	**Phase III - Hour 4** Both teams in field Big Dig continued Artifacts assigned for reconstruction Explanation of MARF (Assignment Sheet 6)	**Phase III - Hour 5** Both teams in field Excavation of tombs
WEEK 4	**Phase IV - Hour 1** Team 1 (2 in library) Reconstruct culture: a) time, setting, themes b) individual interpretation of assigned artifacts c) universals (Assignment Sheets 7-8)	**Phase IV - Hour 2** Team 2 (1 in library) Same as Phase IV - Hour 1	**Phase IV - Hour 3** Both teams: After Museum Cards Confrontation: a) Team 1 presents interpretation of Team 2 b) Team 2 presents what is reality	**Phase IV - Hour 4** Both teams: Same as Phase IV - Hour 3 with roles reversed	**Phase IV - Hour 5** Both teams: Open House and/or Museum Display Before and After Museum Cards Special Awards Cross-examination
WEEK 5	**Final Evaluation** Both teams: Unit grade figured Evaluation of DIG				

Read SPECIFIC INSTRUCTIONS 1-4 (SI 1-4) before proceeding.

TIME SEQUENCE

Student Activity	Teacher Activity
Phase 1 – Hour 1	
Read Student Guide.	Pass out Student Guide and discuss purpose of DIG.
Read CULTURE UNIVERSAL SHEET. Discuss and ask pertinent questions.	Pass out CUS. Explain that these elements (religion, art, language, etc.) have been found by anthropologists to be factors in the cultures of all human societies. Do this inductively if time permits. Ask what types of behavior or ideas are universal to mankind. Try to separate learned behavior from instincts and basic drives. Pursuing the concept of human nature can be rewarding at this point.

Criteria for Experiential Activities

(Stimulated by: Experience and Education, John Dewey, 1938)

An activity should:

1. Have a clear educational purpose
2. Be within the range of capacity of the learner
3. Arouse within the learner an active quest for information or new ideas.
4. Build on the life experiences of the learner
5. Demand progression of intellectual development.
6. Include a method for keeping track of information for later intellectual use.
7. Be followed by extensive work:
   - clarification of ideas
   - expansion of ideas
   - organization of ideas
   - analysis of observations
   - verification of ideas
   - extract meaning
8. Lead logically to next activity

"Learning is the continuous restructuring of experience" (p. 111)

Three Experiential Activities

Directions: Read the 3 activities and then list for each activity the "Criteria for Experiential Activities" that they DO/DON'T address. Which do you think is the better activity? Why?

1. A 9th grade math teacher challenged her students (120 or so) to plan and serve themselves a monthly lunch. She divided her classes into eight teams and put a different one in charge each month. On the first day of the month she collected 45¢ from each student (the amount the sutdents calculated to be the average spent on lunch by the group). The money was given to one of the teams, which began its planning by opening a checking account at a local bank. For the remainder of the month the team researched food prices at local supermarkets, calculated calories per individual, figured how much peanut butter was needed to make 75 sandwiches, and did other necessary tasks. On the last Friday of the month, the lunch was served. This project required students to take responsibility for a real problem. If they had been good problem solvers, everybody got an orange and six M & M's. If they had been sloppy with their math, they had to deal with too few sandwiches to go around, or perhaps too much food and not enough money in the checking account to pay the bill.

   Ron Gager, Teacher Centers and Secondary School Teachers, Washington, D.C.; NEA, 1980, p.17.

2. A 7th grade geography teacher challenges her students to infer about people from their wasterbasket trash (artifacts). Spread some newspaper on a flat place and dump a kitchen wastebasket out. The kitchen wastebasket is usually the one with most interesting and diverse artifacts. You can find everything from bills to banana peels, newspapers to tomato soup cans. Pretend you know nothing about the people who use your kitchen except what you can learn from the evidence you find in their wastebasket. Try to answer some of these questions as you sort through your pile. Remember, you can answer a question only if you have the evidence to support your answer.

   Look through food scraps, and read labels on cans, bottles, and other packaging. What kind of diet do these people have? Are the foods homegrown or imported? If they are imported, from where? Is there any evidence about the kind of fuel used to heat or do other jobs in the house? Are there any oil bills or electric bills? Are there any newspapers or pamphlets that show the type of community these poeple live in? What kinds of games do these people play? Is there a sports page or broken plastic ball? Can you figure out any rules of the game you have found from the artifact you are examining?

   Bruce Porell, Digging the Past: Archaeology in Your Own Backyard. Reading, MA: Addison-Wesley, 1979, 4-5.

Hart, Dan. Beyond Your Classroom: An Outdoor Activity Guide. Eliot Pratt Aspectuck River Valley, Outdoor Education Center, Paper Mill Road, New Milford, CT 06776.@7.50. p.43 3.

3. TEACHING AREA	School Yard
APPROXIMATE GRADE LEVELS	4-8
CURRICULUM	Science
LENGTH OF TIME	Flexible
DESCRIPTION	Careful observation of a large puddle in the schoolyard can coordinate such topics as water, weather, topography.
PURPOSE	To have practical experience with the water cycle; to note the presence and causes of change in the natural world.
MATERIALS	Long string; ruler; thermometer.
PROCEDURE	After a rain, locate a large puddle in the school yard. Why did the water collect in this particular place? Perhaps it is lower than the rest of the area or in an area where little seepage is possible. Place the string around the entire circumference of the puddle. Measure this length of string with the ruler. Record the temperature and, if possible, the relative humidity of the air. Repeat the above procedure in several hours (the following day; the following week) and compare the circumferences of the puddle. Did it stay the same or change in size. If it shrunk, where did the water go? Is there a correlation between the size of the puddle and the relative humidity of the day? Why?
Follow-up Activities	Trace the water cycle from this puddle as the water evaporates into the air, falls upon a mountain, flows down into a stream to a larger river and finally, travels into the ocean. The ocean is a large storage tank for water but it eventually evaporates and rises into the sky again.

Oral Quiz on Archaeology (20 min.)

Directions:

1. List facts generated from class sessions and convert to questions.
2. Do orally one question at a time.
3. Check answers orally after each question.
4. Talley score.
5. Turn name and score in on index card.
   (Review scores while written test being give and make some summary statements written test given.)

Final Exam: 1 hour

Name_____

ED. M 280 Educational Institute
Experiential Education as a Teaching Strategy

I. As part of your science curriculum you have decided to create an "experientially based" unit which uses the school playground. Design the unit focusing on at least 2 experiential activities, their purposes, groupings, planning necessary ways of recording, time needed and other structural details. Use any notes or resource material available that you wish.

II. Can you do these activities with your class this semester?

Yes_____ No_____ Maybe _____

Explain

Classroom Applications Project Guide

The following "Project" should be mailed by October 30th to:

Dr. S. R. Massey
17 Driftwood Lane
Scarborough, ME 04074

I. Develop and implement with students 2 experiential activities. They maybe in classroom, in school, or outdoors. They maybe short (10 min.) or long (3 day) activities.

II. After implementing the activities write a brief (3-5 pg.) report using the following as guide for each of the:

A. What was the activity? (Grade level and subject area)

B. How long was the activity?

C. What was the student preparation for the activities?

D. What was the follow-up to the activity?

E. What were the students suppose to learn?

F. What did they learn?

G. What did you learn?

H. Include a self-addressed envelope for return.